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H & V News

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IRELAND'S BUILDING SERVICES MAGAZINE

H&V NEWS

JUNE 1981



- Flash Steam Recovery
— Case History

- GOLF News and Pictures

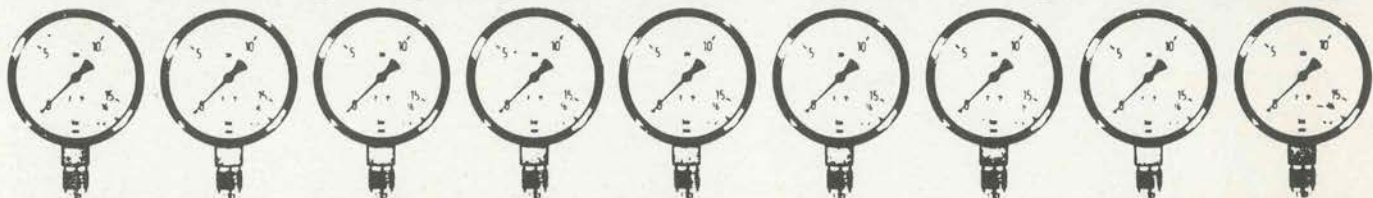
- "Europe's Largest Heat
Pump Contract"



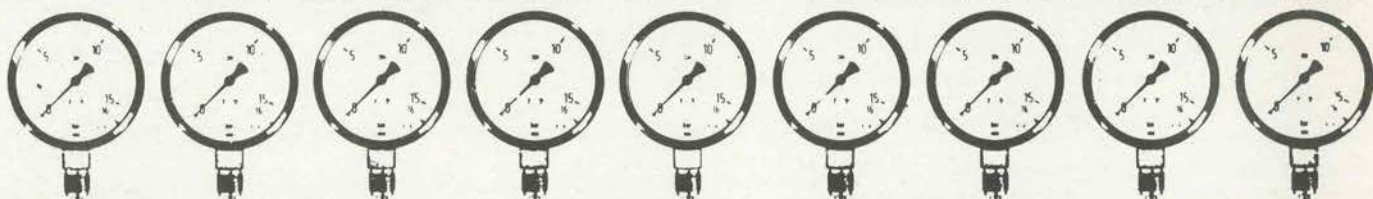
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the most purchased gauge in Europe

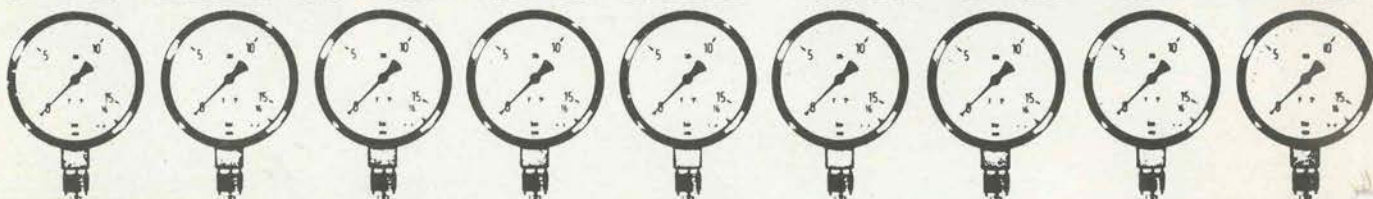
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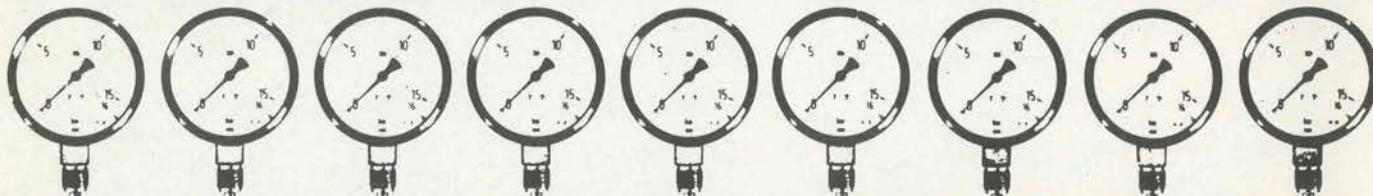
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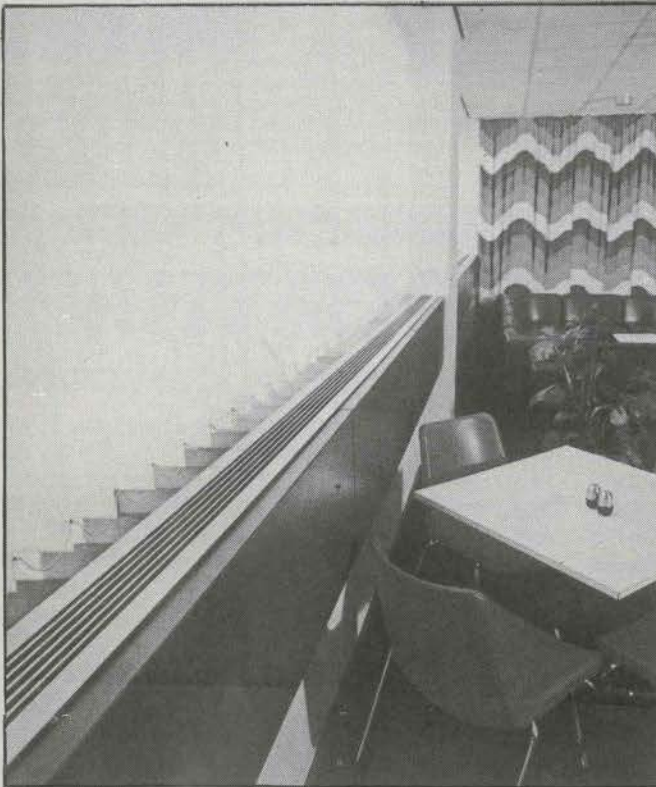
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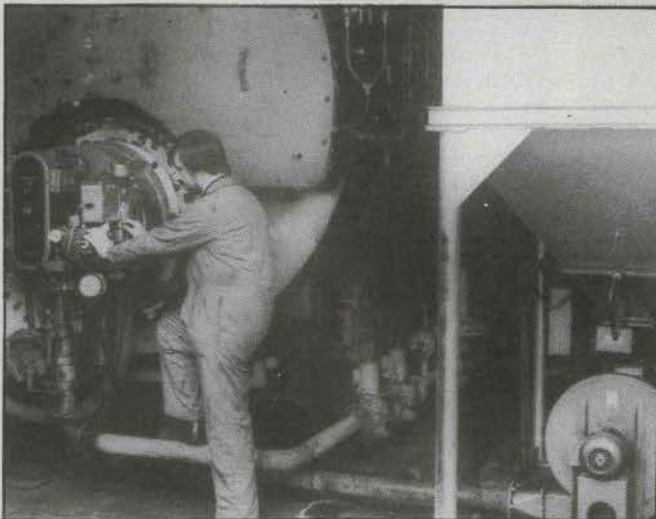


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Industrial & Commercial Boilers & Burners. Page 29

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COVER PHOTOGRAPH BY RONNIE
NORTON AEROSTRUCT LTD SHOWS THE
SUPPRESSOR TUBE ASSEMBLY FOR THE
ENGINE TEST FACILITY AT AIRMOTIVE,
NAAS ROAD, CLONDALKIN, CO. DUBLIN.
BUILT BY WHESSOE (IRELAND) LIMITED
AT THEIR WORKS IN FINGLAS, IT
MEASURES 5 METRES DIAMETER BY 9
METRES LONG. IT IS PART OF A £300,000
CONTRACT PLACED WITH WHESSOE BY
CENTRAL ENGINEERING COMPANY,
MINNEAPOLIS, U.S.A. FOR THE TEST CELL,
SILENCING EQUIPMENT AND FUEL
TANKS.

Lennox Win Major Contract for Dublin Factory

Lennox Industries Ltd of Basingstoke, Hants, have won a major contract to provide heating, ventilating and air conditioning equipment for a complex of factory and offices currently under construction at Coolock.

Prime Computer Inc., an American company, are building a factory for the assembly and testing of visual display units and an office block at Coolock Industrial Estate. Both factory and offices will be all electric and fully air conditioned. Mechanical services

consultants Stephenson Associates have specified 16 items of Lennox equipment.

Twelve Lennox DSSI heat pumps will be used in the factory. These single package units incorporate many effective energy conservation measures, including enthalpy control for maximum use of outside air for cooling. Nominal cooling capacity is 50 kw and heating capacity at 7°C is 48 kw.

In the office block, four Lennox RVZ variable volume multizone units will be

used. These combination heating and cooling units provide simultaneous variable air volume and variable temperature control, giving excellent energy saving characteristics.

The installation will be carried out by Mercury Engineering Ltd. of Dublin, and when completed next September, will be probably one of "Europe's largest heat pump installations."

Lennox products are distributed in Ireland by C & F Ltd.



A FITTING GET TOGETHER BY

Three leading Irish companies recently joined forces in the Gresham Hotel, Dublin, with an extensive exhibition to customers from the merchants, trade, and Government Bodies of their 1981-82 range of plumbing fittings.

Unidare Limited, John Usher Limited and Modern Plant Limited, hosted the exhibition.

The display range included Unidare's Terrain PVC systems, the Twyford bathroom fittings, and Sphinx tiles from John Usher, and the famous "Mira" showers and fittings from Modern Plant Limited.

After the exhibition all the companies were pleased with the response and have reported significant orders.

Unidare/Terrain

On display at the exhibition was the new Unidare Terrain rainwater systems in white true square section. This now complements the range in black and grey which have been successfully in use for years in both square and half round. This latest development by Unidare Terrain will be welcomed by both professions and trade.

Also on show was the Terrain soil and waste solvent weld system which uniquely allows Unidare to offer pre-fabricated stacks to suit all installations. This represents significant saving to builders reducing on site labour costs.

Unidare Terrain below ground drainage 1800 systems is a complete lip seal jointing system which complies to all Local Government and B.S. specifications as with all Unidare Terrain products.

Modern Plant

With the slogan "Technology you can trust" and under the brand name of Mira — Modern Plant Limited launched three new products into the fast-growing shower market. These products are complimentary to their existing well known range of Mira Showers manufactured by Walker Crossweller and Company, Cheltenham.

Miralec 'Supreme'

The new Miralec 'Supreme' is the new instant electric shower. Each unit comes complete with flexible hose, detachable handset and slide bar which permits a variety of shower heights

and spray angles. The 'Supreme' is compact and has a splash proof body. It will maintain showering temperature to 2 1°C approximately, despite normal changes in mains pressure. The unit will operate at a minimum of 10 PSI because of a special 'governor' unit mounted inside the unit on

the water supply inlet.

Mira 915

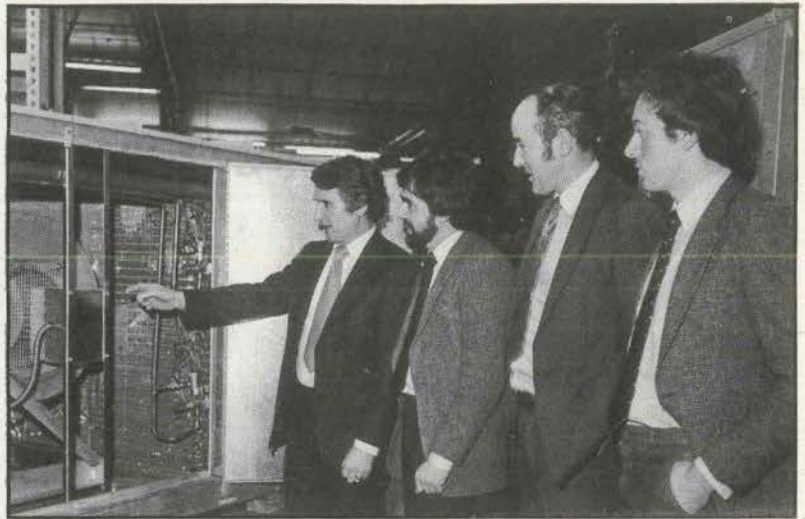
"The most advanced shower control in the world". This is the claim of the new Mira 915 Thermostatic Shower Control. Shower spray temperature can be easily adjusted to within tenths of °C on the numbered temperature control. The



● Inspecting the Mira 15 shower were (L-R) Noel Corrigan, Technical Representative, Modern Plant; Brendan Coleman; V Reilly; and D C Arbon, Managing Director, Walker Crossweller.



● This happy group pictured at the recent signing of the contract for Prime Computer Inc in Dublin. Pictured (left to right) are: Ed Sheehan, Project Manager, Prime Computer Inc; Jim Smith, Contracts Director, Mercury Engineering, Contractors; Don Munson, Managing Director, Lennox Industries Limited; and Brian Geraghty, Stephenson Associates, Architects/Consultants.



● Following the official signing of the contract the guests were taken on a brief tour of the Lennox plant at Basingstoke, Hants. Leading one of the groups is Fred Evans, (left) Lennox Industries Ltd Sales Director, who is explaining the fan assembly on a DSSI heat pump to Brian Geraghty, Stephenson Associates, John Duignan, Managing Director, C & F Ltd, Mill Lane, Palmerstown, the Lennox Distributors in Ireland and Shane Gogarty, Stephenson Associates Architects/Consultants on the contract.

THREE IRISH COMPANIES

temperature is maintained to within 1°C despite a sharp drop in the hot or cold water pressure or sudden changes of up to 10°C in either inlet temperature. The strength of the shower spray can be altered without affecting temperature, using a separate flow control. Should the cold

water supply fail, the Mira 915 will shut off completely in under 1.5 seconds. A built-in temperature stop (set at 45°C) prevents selection of a temperature too hot for comfortable showering. The Mira 915 is available with the full range of Mira shower fittings supplied as a complete package or

purchased separately. The new technology and low stress design used in the Mira 915 means that a long maintenance free service life is assured even in hard water areas.

Mira 22

The new Mira 22 bath/shower mixer with matching taps has now made its

debut. Mira 22 is designed to replace the separate taps on a bath. It comes complete with a flexible hose leading to a shower handset with wall mounted holder. Available as an extra is a pair of matching basin taps. Cast in brass, mixer and taps can be chrome or gold plated.



● Pictured on the Unidare/Terrain stand were (left) D Luke, Sales Director, Unidare Engineering Ltd and John Martin, Marketing Director, Terrain.



● On the John Usher stand were (L-R) Goff Pardoe, Twyford; Hugh Mangan, Mulcahy McDonagh & Partners; and John Usher (John Usher Ltd).

Westinghouse Plant

● The giant Westinghouse Electric Corporation marked its latest progress in Ireland last week when the Minister for Industry, Commerce and Tourism, Mr Desmond O'Malley, opened their 150,000 square foot plant at Kells, Co Meath. WEBSCO, the Westinghouse Electric Building Systems Company, is manufacturing open office furniture and heating and cooling equipment. Pictured at the opening of the new Westinghouse Electric Building Systems Company plant at Kells, Co Meath, were, left to right:- Mr Desmond O'Malley TD, Minister for Industry, Commerce and Tourism who officially opened the plant; Mr Thomas J Murrin, President of Westinghouse Electric Public Systems Company, and Mr Edward J Fogel, Managing Director of the new plant.



STRINGENT TESTS FOR ISO KAERNS CHIMNEY

The Iso Kaern chimney was recently subjected to what must be the most stringent tests in the world, that of the Canadian testing authority, Underwriters Laboratories of Canada. The chimney was tested for thermal shock and severe fire heat and throughout showed no ill effects.

The test was conducted up to a temperature of 947°C for 10 minutes three times with intermittent close down to 21°C. The chimney equilibrium did not rise above 680°C. Further tests to 1204°C for 30 minutes each three times with close down to 282°C between each test. A further

test to 974°C for 60 minutes duration from 680°C to 974°C constant 60 minutes and down to 282°C concluded the authorities tests. The chimney was unaffected by thermal shock and maintained equilibrium as shown.

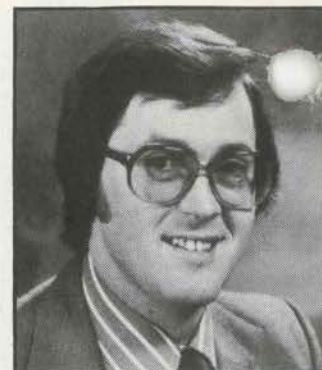
Iso Kaern are distributed by C P Glorney Ltd.

Hunter for HRP Walker

Brian Hunter has been promoted to General Manager of the HRP Walker division of Walker Air Conditioning Limited with responsibility for its operation throughout the 32 counties.

Hunter, aged 31, joined the company in 1974 and was appointed to the Board of Walker Air Conditioning (UK) Limited five years later.

In addition to his new



● Brian Hunter

post, he will retain responsibility, as Director of Walker Air Conditioning (UK) Limited for the Company's mainstream activity in the North, distributing Carlyle air conditioning, refrigeration and heat pump equipment. He will continue to be based at Belfast and will report to Jim Anderson, Walker's M.D.

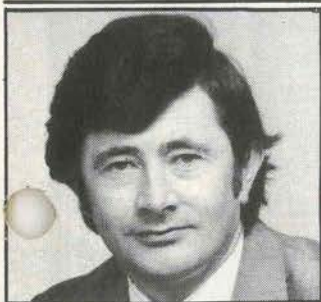


● Pictured at the Shelbourne Hotel, Dublin during the first National conference on "Energy Use Management", and organised by the Institute for Industrial Research & Standards, were (left to right): Henry Flood, Chief Engineer, Bord na Mona who spoke on "Peat Products"; Tim Cahill-O'Brien, Chief Architect Industrial Development Authority, and Denis Skelly, of Calor Kosangas and Chairman of Irish Liquefied Petroleum Association, who spoke about "Developments in LPG".

COOLAIR CONTRACT

Two centrifugal water chillers, with a 560 ton cooling capacity, are to be supplied by Coolair Limited of Dublin for installation at the new extension to the Drogheda plant of Becton Dickinson & Co Ltd, the medical instruments manufacturer.

On the project, Coolair are working in conjunction with mechanical contractors T Bourke & Co Ltd and consulting engineers Seamus Homan Associates.



● Wavin Pipes Ltd, the largest Irish manufacturer of plastic pipes and fittings, announce the appointment of Mr John D Hourican, as Financial Controller.



● Pictured above are the candidates who passed the Coal Information Services examination after attending the SFAS/CIS training course in Cork. Included in the picture are Dick Barry, TD, who presented the awards (centre front row) and Jim Maher, Managing Director, CIS Ltd (4th left back row).

Simplex Distributors

Simplex Detection and Controls, a division of Simplex Time Recorder Co (UK) Ltd, have appointed Building Protection Systems Ltd as distributors for Northern Ireland and the Republic of Ireland.

The extensive local knowledge of Building Protection Systems combined with immediate access to technical support from the

Division's headquarters at Halifax, will result in a highly efficient service for new and existing customers alike. Headquarters personnel will work closely with the distributors to provide presentations, demonstrations and training schemes with faster maintenance and servicing being provided by on-the-spot engineers.

The newly-appointed

companies will be distributing the full range of products from Simplex Detection & Controls Division, including the new 2400 and 2350 Energy Management Systems, the Multiplex 2100 combined fire, security and monitor control system and a full range of FOC approved fire and smoke detectors.

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Annual CIBS Golf Outing



● Out on the course at Hermitage GC at the recent CIBS golf outing were (left) Eamon O'Brien, new Chairman CIBS, Republic of Ireland Branch, and Pat Curley, Cooney Jennings.



● Viewing the prizes at the annual CIBS golf outing were (L-R) Tony Fortune, Jacobs International, Michael O'Doherty, Delap & Waller, and Tom Scott, Hevac.

Armstrong Appoints Irish Representative

The Insulation Products Division of Armstrong World Industries Limited recently announced the appointment of Mr Alan Beattie as Technical Representative for the Republic of Ireland and Northern Ireland.

Alan Beattie brings to his appointment a wealth of knowledge and expertise in

the industry having previously worked for some seven years with Myson. Based in Kildare he will be responsible for sales of the complete range of Armstrong insulation products and will report direct to Tim Wright, Regional Sales Manager, based at Uxbridge headquarters.

IDHE NEWS

NEW COMMITTEE FORMED AT AGM

At the recent AGM of the IDHE held in the Central Hotel, Dublin, the following committee was elected for 1981/82.

Chairman: Victor Madigan, Coppercraft Ltd; **Secretary:** Harold Pattison, Energy Department, IIRS; **Treasurer:** Gerry Griffin, Oil Fired Services; **Committee:** C O'Connor, W Penrice, C Kane, K Long, D Lyons and K Kavanagh.

It was decided by the committee that the following activities would be organised for the new season for the members benefit:

Golf outing at Bodenstown in May.

Dinner Dance. Details to be notified later.

(a) AGM Thursday 24th September, 1981. Details from Secretary.

(b) Presentation of Diplomas and prizes for 1981 at AGM.

Special affiliate members meeting, 18 June, 1981 at Clyde Road. Details from V Madigan, Coppercraft. Phone: 265146.

Special Education Committee Meeting, 6.30 pm, 30 June, 1981, Clyde Road. Details from K Long at P J Mathews. Phone: 779137.

Bi-Annual Convention, Friday 23 October, 1981. Martello Room, Jury's Hotel, Dublin. Details from Secretary.

Visit to Runtal Rad on Saturday 13 June, 1981. Coach will leave car park, Heuston Station at 8.30 am on the

morning of the 13th. Tour of Runtal Rad — am, 13 June, lunch with our sponsors and then a tour of Tube Rollers. As it will be only possible to accommodate 35 persons on this works visit, the places will be allocated on a first come first served basis. The all in cost for the day is £5.00. For further details ring Kevin Kavanagh at 375942.

IDHE Annual Convention (England) will be held in London on the 4/5 June. Full details from V Madigan or W Penrice of Design Heating. Phone 884850.

The new committee has pledged to re-activate the role of the IDHE Irish Branch. However, as Harry Pattison says in the IDHE Newsletter, it will be impossible to achieve this objective if the members themselves do not co-operate in all the activities of the IDHE.

A further Newsletter is promised for later in the year when final details of the Institutes Winter Lecture Programme have been arranged.

IDHE Golf Outing at Bodenstown

The results of the outing are as follows:-

Overall Winner: Terry Nichol.

Class 1 — 1st: John Murphy; **2nd:** Ian Williams; **3rd:** Aubery Moriarty.

Class 2 — 1st: Cahill Connolly; **2nd:** Garry Stewart; **3rd:** Eamon Cullen.

Class 3 — 1st: J J Ryan; **2nd:** D Prendergast; **Joint Third:** Brendan Bracken, Joe Hogan.

1st Nine: Eamon Vickers; **2nd Nine:** C O'Meara.

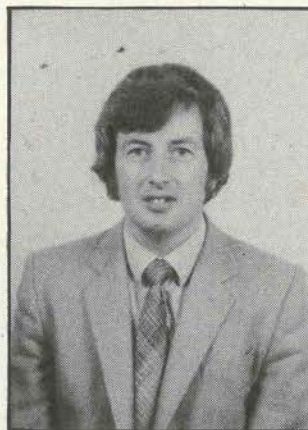
New Design Office

Facilities Systems Engineering Corporation of California, has concluded negotiations with the IDA to establish an architectural and engineering design office in Dublin. The company plans to employ 18 persons this year and increase this to 72 persons within five years. Most of the jobs will be for architects, engineers, designers and draughtsmen.

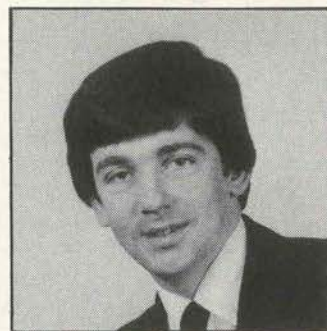
Facilities Systems Engineering Corporation provides architectural, engineering and construction management services to the energy, aircraft, aerospace,

defence and food industries. The Corporation is involved with US Government agencies and major industries in the US with research and development projects. Customers include: NASA, The Department of Energy and Transportation, the US Air Force, Army and Navy, Lockheed Aircraft Company and McDonnell Douglas Company.

The Irish office will concentrate initially on technical services for the energy and food markets.



● Frank Cahill has been appointed Senior Sales Executive with Thermaplant, covering the Dublin and Leinster Areas.



● CHS Limited announce the appointment of Michael Goonan as Sales Representative. Michael will be responsible for promoting the company's products to Builder's Providers in the counties of Clare, Galway, Mayo, Sligo, Donegal, Leitrim, Roscommon, Monaghan, Longford and Cavan.

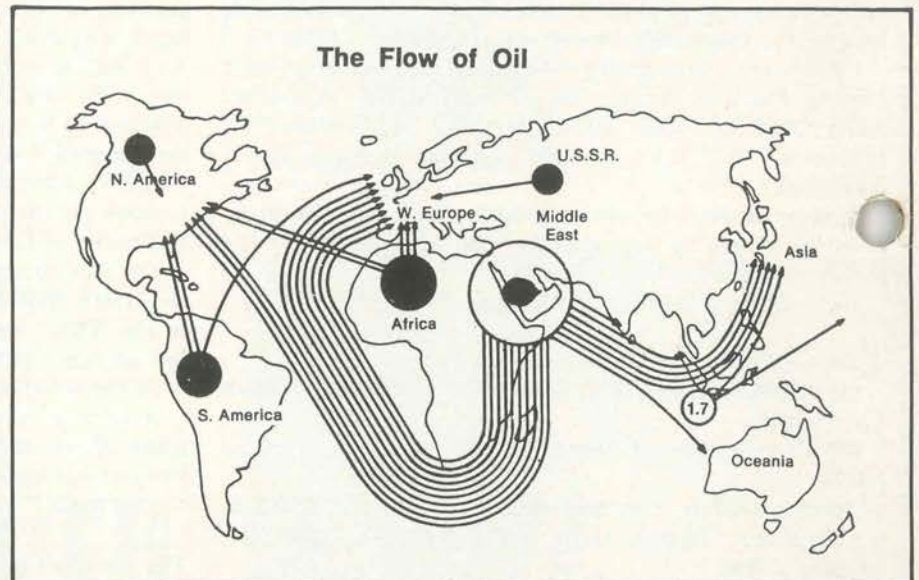
DL's ENERGY REPORT – OIL

In our last article we stated how precarious world energy supplies were and also the problems of interruptions of supply where even a relatively small supplier can have significant effects on world supplies. We also stated that oil was the life blood and liability of the energy system. In this Article we will take a look at oil, the world problems involved, and the delicate and precarious position of supply and demand. Table 1 shows OPEC oil production and capacity for the years 1970 to 1982.

At the outset it is important to realise that oil is the foremost fuel for lighting and lubrication and from the earliest beginning, has ultimately flourished into the worlds largest industry, as shown in table 2. Oil is convenient, it's particularly suited to the use of motor vehicles, also a 42 gallon barrell of crude oil has the same energy output as 5,700 cubic feet of natural gas or about one quarter tonne of coal. Regretably its extreme cheapness encouraged wasteful use. The world has had a love affair with the automobile and oil seemed endlessly abundant, it was, until recently cheap, it is the most portable, the most convenient for transportation and the most versatile.

In recent years we have seen the emergence from the Third World of a privileged group, the relatively few oil producing nations that hold the economic wealth of industrial societies in their hands, these are the OPEC countries. Table 3 below shows OPEC oil production and exports.

In 1973/74 we had an oil embargo, in 1979, the Iranian Revolution. The losses were puny when compared to a cut off Saudi Arabian oil or worse still all Persian Gulf oil. Yet the impact is still vivid and an unpleasant memory. In 1973/74 OPEC quadrupled oil prices. They furthermore were dismayed by the dwindling purchasing power of the dollar, so OPEC countries continued to push up its prices. By 1980 it had reached the price of \$32 and many oil countries charged substantial premiums and traders in the spot market demanded even more. Today we have a glut of oil, but prices are still high, and the glut is more at the discretion of the Saudi Arabian's. Consequently, we still have no cause for complacency. It goes without saying that the world (including Ireland) have got to lessen our dependence on oil. We are ex-



tremely vulnerable on some of the most politically unstable parts of the world. Bristling with ancient feuds, religious hatred and nationalists ambitions. At any moment as we have seen in the last three times during the seventies, wars, revolutions or political action in oil producing states can abruptly cut off ship-

ments of oil to the West. So delicate is the balance of world oil supply that the cessation of supplies from even a minor producing country for a comparatively short time causes a major dislocation in supply and price. Nor does it appear that price will stabilise. Table 4 shown below projection obtained by the NBST of

OPEC: Oil production and capacity trends

Table 1

Million barrels per day



*Assuming OPEC countries produce at preferred levels of production

Source: CIA, *The World Oil Market in the Years Ahead*, Aug. 1979.

Table 2 Top 12 energy producing companies in 1978
—on Btu and dollar basis

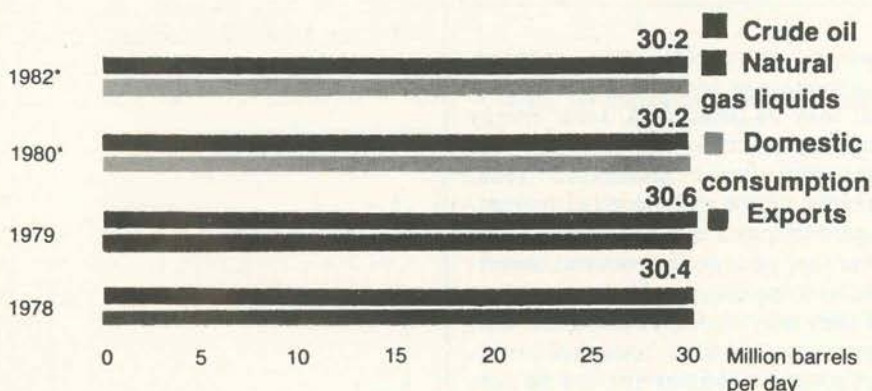
Company	Energy production (trillions of Btu's)	Percent of total U.S. energy production	Company	Energy production (millions of dollars)	Percent of total U.S. energy production
Exxon	3854.4	5.9	Exxon	4211.2	6.6
Atlantic Richfield	2713.7	4.1	Texaco	2783.8	4.4
Texaco	2291.0	3.5	Atlantic Richfield	2319.5	3.6
Standard of Indiana	1862.1	2.8	Standard of Indiana	2302.9	3.6
Continental	1795.8	2.7	Shell	2287.4	3.6
Shell	1758.8	2.7	Gulf	2034.7	3.2
Gulf	1716.1	2.6	Standard of Ohio	1889.2	3.0
Standard of Ohio	1352.9	2.1	Continental	1740.2	2.7
Mobil	1329.9	2.0	Standard of California	1532.7	2.4
Kerr-McGee	1309.3	2.0	Mobil	1520.1	2.4
Peabody	1201.3	1.8	Phillips	1172.6	1.8
Standard of California	1163.6	1.8	Getty	1149.2	1.8

● Source. Energy Production figures were calculated by aggregating production for each energy source, as reported by Elizabeth Sowell and Martha Brannon, in "Market Shares and Individual Company Data for U.S. Energy Markets: 1950-1978".

Table 3

Table 28

OPEC oil production and exports, 1978-1982



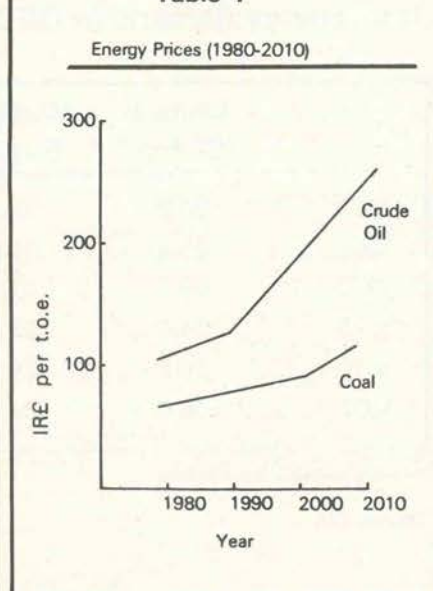
*Output projections are based upon announced production policies or trends in capacity and output and reflect current or planned capacity addition programs.

Source: CIA, *The World Oil Market in the Years Ahead*, August 1979.

energy prices into the year 2010.

As a result of the increase in the price of oil it can be fairly said that it has played a significant part in weakening the international monetary system, in stimulating inflation, and as a result we have had recession and unemployment world wide. The world is now paying an extravagant price for energy rich way of life. The problem is not entirely oil. The Irish economy, along with others including the U.S.A., has been heavily dependent on cheap energy, cheap electricity, cheap coal as well as cheap oil. These energy sources are no longer cheap and their escalating costs is itself a serious matter but none poses the sobering threat of economic dislocation, social disruption and national peril that accompanies every barrel of imported oil. Ireland like all other

Table 4



countries has had to pay a staggering amount of money for its imported oil, and this is shown in table 5.

Is there a quick solution to the problem? The answer is no. Most people like to believe that technology will solve any problem quickly if they work at it hard enough and have enough money to spend. After all didn't America moon reach the moon with money and technology. However, in the case of energy such belief is compounded by wishful thinking and a lack of understanding of the limits of technology when faced with complex and intractable problems. It also fails to appreciate that often obstacles are not technological but institutional, pressures from interested groups feel that it would be adversely effected by new developments or inertia on the part of decision makers, unions, architects or government officials. One has only to consider that 1973 was the first major hiccup of Arab oil. Today nine years later the non-oil producing countries are as dependent on the oil producing countries. Yes, demand for oil has dropped considerably in the last year, but this is due more to the drop in world industrial production. Also there is nothing to stop Saudi Arabia from reducing its output. There were much heard of plans for huge increases in nuclear energy, increase in coal production, development of sale oil, all of these were laid aside or were delayed.

Unfortunately all the major institutions that may have a substantial effect on our fuel supply tend to be years away, usually much further than the sponsors care to admit. They require development and careful testing of new technologies. Mobilisation of billions of pounds or dollars, a new capital at high interest rates and construction of huge facilities, they often involve risks such that the private enterprise tackle only after extense of subsidies.

For these reasons energy experts do not expect any large contribution from new sources of energy such as shale oil or oil from coal or geothermal energy until the 1990's or later. The renewables, biomass energy from the sun, ocean thermol energy, wind power and so on will be slow in coming.

Virtually every proposal for adding to our energy supply involves hidden costs, unpleasant side effects and uncertainties. Nuclear energy the major answer to all problems bears the handicap over the worry of radio activity, a worry that has been sharpened by Three Mile Island, that breather reactor conjured up fear that

Table 5
Ireland: Cost of Energy Imports and the G.D.P.

Year	'73	'74	'75	'76	'77	'78	'79
Energy Imports) (£m)	71	216	232	293	365	355	558
G.D.P.	2678	2946	3676	4513	5383	6356	7383 (Est)
<u>Energy Imports</u>							
G.D.P. (%)	2.6	7.3	6.3	6.5	6.8	5.6	7.6
Oil Share of Energy Import Bill (%)	86	92	92	92	90	89	89

Note:

Oil's share in the total energy usage (Mtoe/yr) has remained relatively constant at about 75% during the above period. Between 1968 and 1973 oil imports doubled and despite the price increases have risen still further since.

plutonium produces might increase proliferation of a nuclear bomb, coal also poses serious handicaps, unfortunately it contains sulphur and other undesirable substances such as heavy metals which are only partly removed from burning omission, despite costly and difficult procedures. The sulphur omission damages human lungs, they combine with moisture in the atmosphere to form acid precipitation that defaces volument and buildings and kills the life of countless lakes.

A far greater portent is the accumulation in the atmosphere of carbon dioxide from burning coal and other fossil fuels. Carbon dioxide tends to trap heat on the earth surface, as sufficient concentration it could create the dreaded green house effect. So these in both the United States and United Kingdom forecast that the concentration of carbon dioxide by the middle of the next century will be doubled by what it was before the industrial revolution. If its correct such a concentration could increase average global temperatures by 2°C and pole temperatures by as much as 7° that such warming slight as it may seem would seriously effect distribution of rainfall and could create deserts as much as the Northern Hemisphere bread basket. It would be a near adversment of catastrophe of unparallel magnitude affecting all mankind. Other energy sources offer their own peculiar problems, synfuels

involve extensive strip mining, enormous cost and demand for water that may be prohibited, solar energy also may be costly and may run into interesting legal problems. Wind turbines will be given sides with greater care to avoid estatic problems, the noise they produce has proved objectable in some cases and in large numbers they may create interference with telecommunications. Alcohol from agricultural products for use in cars raises a spector of food verses fuel.

Finally the burning of biomass favoured by some environmentalists greatly worries others, they fear that

might be a rapid distruction of forest lands and serious deterioration of agricultural soils if they had to be deprived of organic matters. In essence the energy problem is global, there are no immediate answers and technology cannot be turned like water coming out of a tap. Therefore, as we have seen major energy technologies will take too long to help much of the 1980's. Even if large new gas and oil fields are discovered they too will require years of development, study after study reaches the same conclusion, the cleanest and least expensive and least vulnerable energy option is to use less by being more efficient. Only conservations can be implemented quickly enough to make a substantial difference. In essence it means co-generation of electricity along with industrial heat developing, evermore efficient automobiles, car pooling, improving building designs using more and better insulation and so on.

Total energy demand in OECD countries*

	United States	Western Europe	Japan	Canada
1960	20.9	12.4	1.6	1.8
1965	25.4	16.5	3.0	2.5
1970	32.7	21.5	5.5	3.4
1975	34.9	23.2	6.7	4.1
1976	36.2	24.7	7.1	4.2
1977	38.0	24.8	7.2	4.3

*Excluding Australia and New Zealand

Source: CIA.

Table 6

By Terry McQueen*

- i.e. 1) The Vent and Feed.
- 2) The Appliance.
- 3) The System.

In all cases, the vent and feed pipes are open to atmosphere and the pressure exerted by the Feed and Expansion tank (the static pressure) is hardly affected by gravity flow friction pressure drops in the appliance or the pipework, and so for a purely gravity activated system, the lengths LV, LF and consequently the heights

Generally the pump head in a normal domestic dwelling is higher

From Fig 2 we can see that there are four possible positions in which a pump can be inserted marked 1, 2, 3 and 4 on Fig 2 (site visits over the years have proved that all of these positions are used by the trade, even though position 2 and 3 break the author's 3 Tee rule (quoted in last month's article) and obviously do not allow the installation to have an unhindered feed or vent respectively).

Fig 3. Pressure graph pump position 1.

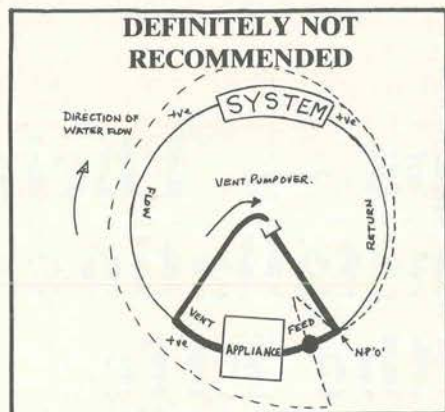


Fig 4. Pressure graph pump position 2.

These positions should never be used for a pump for this reason alone, but we will examine what other effects such positions of location of the pump have on our installation as a whole.

Pump Position (1) (Not Recommended) Fig 3

With the pump in position 1, i.e. fitted to the system return pipe between the system and the feed connection point to the return; the pump pressure relative to the neutral point (NPO) creates a positive pressure rise at the pump position (shown +ve and dotted outside the installation circle). From the neutral point (NPO) clockwise around the circle (direction of water flow) we experience a continuous reduction in pressure due to the circuit resistance until the pump position is again reached (shown dotted within the installation circle, and shown as a negative pressure).

Whilst the vent is under negative pressure (i.e. water will be pulled down the vent and not pumped over into the F & E Tank). The whole of the system (i.e. radiators and cylinder) is subjected to sub atmospheric or negative pressure and consequently, any poor 'O' rings, packing glands, joints or union connections will allow air to be sucked into the system.

Evidence by our inability to escape water from the radiator vent point when opened with the pump running.

This pump therefore, is not recommended for any system where the static head is not greater than the pump head + $\frac{1}{2}$ of the pump head, and is generally unsuitable for the average domestic dwelling.

Pump Position (2) (Not Recommended) Fig 4

With the pump in this position (i.e. actually in the Feed pipe between the appliance and the feed connection point to the system return pipe) Fig 4

shows the simplified pressure relationships around the installation in total.

Obviously the pump in this position hinders the feed pipe which is unacceptable (and possibly dangerous) and in addition, the Vent pipe is under positive pressure and is extremely liable to pump over.

The only point in favour of this is the fact that the whole of the system is under positive pressure, and water will be forced out of any bad radiator packing glands or joints etc. *This Position is definitely not recommended.*

(Pump Position 3) (Not Recommended) Fig 5

With the pump in this position, actually in the vent pipe section between the appliance and the vent pipe connection point to the system flow pipe, then Fig 5 shows again the simplified pressure relationship around the total installation.

Obviously the pump in this position hinders the vent pipe, which

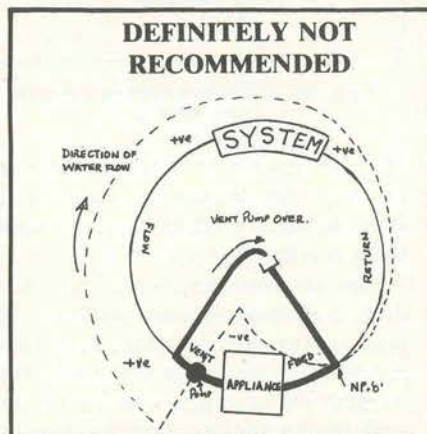


Fig 5. Pressure graph pump position 3.

again is unacceptable, and possibly dangerous.

In addition, the vent pipe is under full pump head positive pressure, and unlike the position 3 case, does not even have the boiler resistance reduction in pressure to reduce the pumping over at the vent.

Again the system itself is positive and this is the only point in its favour. *This Position is definitely not recommended.*

Pump Position 4 (Recommended) Fig 6

With the pump in this position, in the system flow pipe, i.e. between the system and its flow pipe connection to the vent, then Fig 6 shows the only really recommendable pump position for use in general domestic installations.

As can be seen, the vent is under

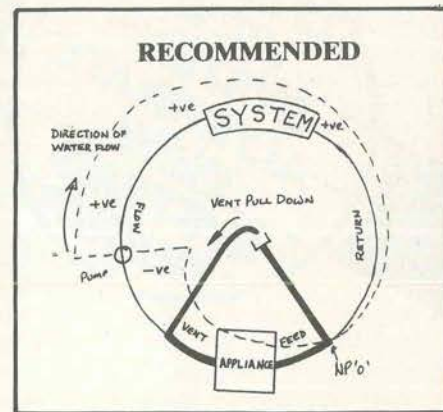


Fig 6. Pressure graph pump position 4.

negative pull down (Pressure = Static pressure - resistance of boiler and pipework resistance LV plus LF) hence there will be no pumping over of the vent.

The total system is similarly under positive pressure (Pressure = Static pressure + pump pressure - system resistance progressively increasing) consequently air will not be pulled into the system, and bad joints or poor radiator packing glands or 'O' rings will be found by water escaping from these points.

Consequently, this is the only real position that can be recommended for the fitting of a pump in normal domestic central heating installations.

Conclusion

Of the four possible pump installation positions, only Position 4 enables the installation to be reasonably free from some of the basic problems encountered in practice when deviation from this position occurs.

It is important that systems do not suffer from these problems which are:-

- 1) Air intake at poor joints etc., and the subsequent corrosion in the installation.
- 2) Vent "Pump Over" and subsequent corrosion, not to mention steam-ed up lofts.
- 3) Poor natural venting preventing the removal of gases from the installation during filling, and early "Running In" of the installation.

Experience has shown that ancillary air separators etc., are not normally necessary when a good pump position is chosen and a good pipe-work arrangement is employed, since these devices and similar, are of value when removing bubbles of air, but cannot reduce the amount of dissolved air.

Sometimes they only mask the symptoms of basic design faults, and customer and installer alike only become aware of the real problems

when premature corrosion of radiators has taken place.

Utilising the principles in this, and the previous article on vents and feeds, will assist the installer and designer to offer a reasonably trouble free installation (thus far) to the customer.

Appreciating that the pressure at the vent during running = Static pressure minus resistance of pipe LV and LF together with the resistance across the appliance or boiler will enable the minimum height of the vent HV to be determined easily. The pull down on the vent will also enable the

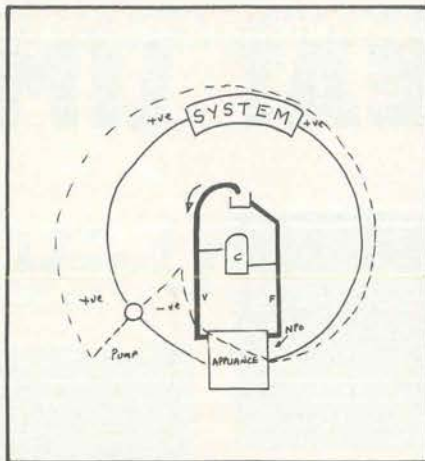


Fig 8. Pressure graph pump position 4 (4 connection boiler, Gravity D.H.W.).

minimum height HF to be determined in conjunction with the pipe size used for the feed pipe (see 1st article).

Examination of Figs. 7 and 8 will show that these comments apply equally to installations that are fully pumped, or which are a combination of pumped radiators and gravity domestic cylinder.

They similarly apply when a four connection boiler with independent vent and feed pipes, or a two connection boiler is installed.

Future articles will examine how

such systems may be controlled to give economic running costs to the user, and will examine some of the basic system pipework errors that can be inadvertently made, and how to recognise them easily.

Terry McQueen is the domestic heating division sales manager, for Scotland, Ireland and N.W. England, for Honeywell Control Systems Limited.

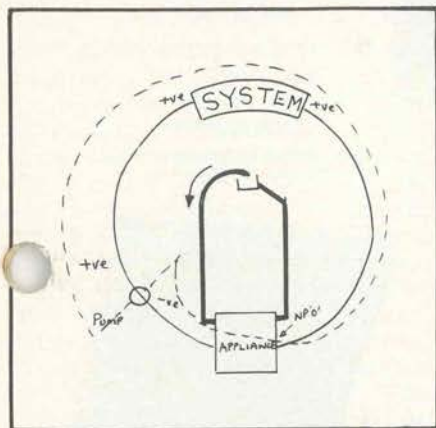
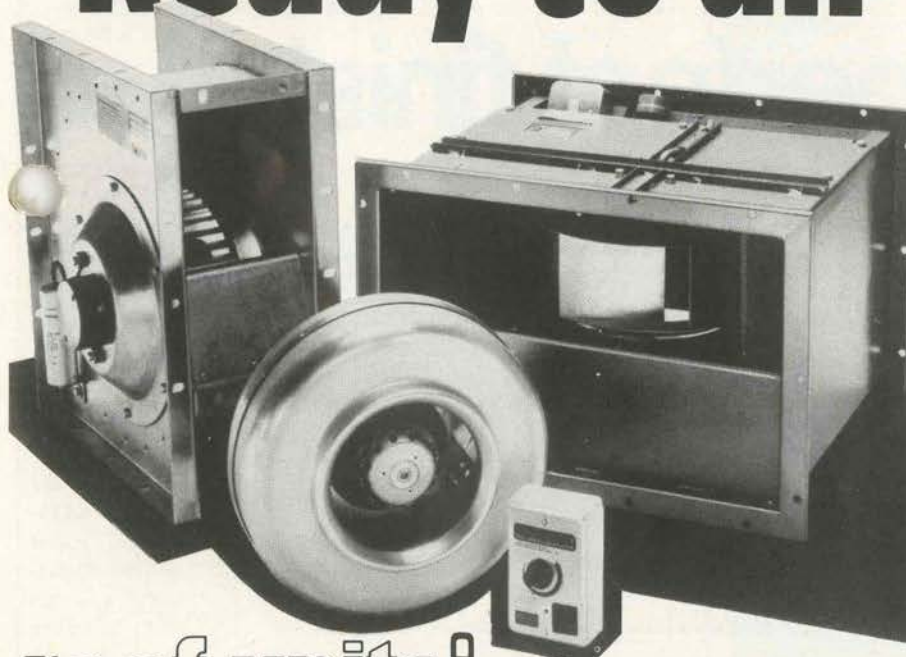


Fig 7. Pressure graph pump position 4 (4 connection boiler).

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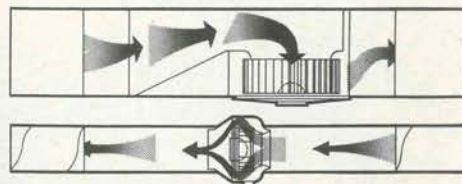


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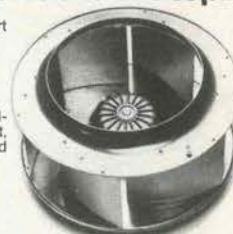
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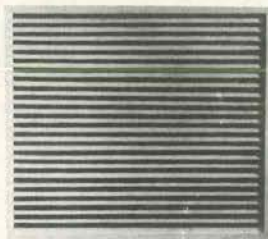
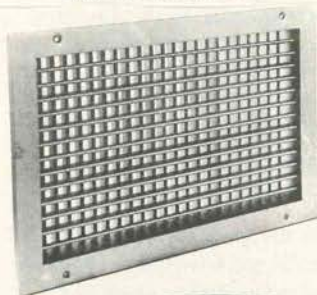
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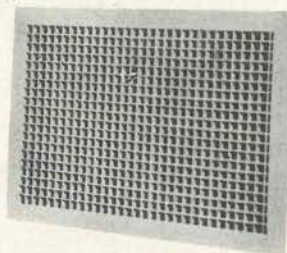
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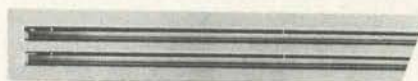
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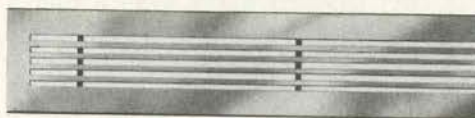


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FLOW OF AIR IN DUCTS

General laws for the flow of fluids were determined by Reynolds, who recognised two flow patterns, laminar and turbulent. In laminar flow the liquid can be considered as a series of parallel strata, each moving at its own speed, and not mixing. Strata adjacent to walls of the duct will be slowed by friction and will move slowest, while those remote from the walls will move fastest. In turbulent flow there is a general forward movement together with irregular transfer between strata.

In air-conditioning systems, all flow is turbulent, and formulas and charts show the resistance to air flow of ducting of various materials, together with fittings and change of shape to be met in practice. The reader is referred to the tables and charts in CIBS Guide C4 (Ref. 4) and in Ref. 42 (chap. 6), and the fuller theoretical analysis in Ref. 38 (chap. 15).

High duct velocities show an economy in duct cost, but require more power which will generate more noise. Velocities in common use are as follows:

High-velocity system, main duct 20 m/s;

High-velocity system, branch ducts 15 m/s;

Low-velocity system, main ducts 10 m/s;

Low-velocity system, branch ducts 6 m/s;

Ducts in quiet areas 3-4 m/s.

Ducting construction must be stiff enough to retain its shape, be free from air-induced vibration (panting) and strong enough to allow air-tight joints along its length. Such construction is adequately covered by HVCA Specification No. DW.141 for sheet metal, No. DW.151 for plastics and No. DW.181 for g.r.p.

The frictional resistance to air flow within a duct system follows the general law

$$H = a \frac{v^2}{d}$$

where a is a coefficient based on the roughness of the duct surface and the density of the air. Where square or rectangular ducts are to be calculated their

dimensions are reduced to an equivalent diameter.

Within the limits of operation of normal air-conditioning system tables or charts can be drawn up, based on this law.

Example What is the resistance pressure drop in a duct measuring 700 x 400 mm, if the air inflow through it is 2 m³/s? What is the velocity?

From the chart (Table 20-1), reading down the 700 x 400 line until it meets the horizontal line through 2 m/s gives

Pressure drop = 1.0 Pa/m
Velocity = 7.1 m/s

It should be noted that the energy for this pressure drop must come from static pressure, since the velocity, and hence the velocity pressure remains constant.

Frictional resistance to air flow fittings such as bends, branches and other changes of shape or direction will depend on the shape of the fitting and the velocity, and such figures are tabulated with factors to be multiplied by the velocity pressure. Tables of such factors will be found in standard works of reference.

Example The duct specified above has in it two bends, for which a pressure loss factor of 0.28 is shown in the tables. What is the total pressure loss.

Pressure loss per bend = $p_v \times 0.28$

$p_v = 0.5 \times 1.2 \times v^2$

where $v = 7.1$

$p_v = 30.25 \text{ Pa}$

Pressure loss = $2 \times 0.28 \times 30.25 = 16.94 \text{ Pa}$

The sizing of ductwork for a system will commence with an assumption of an average pressure-loss

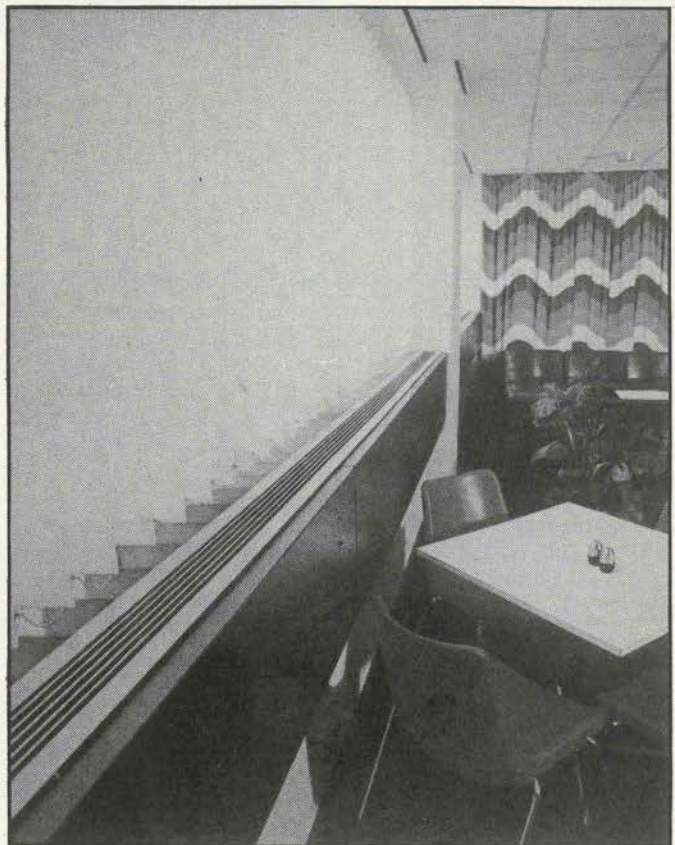
figure, based on a working compromise between small ducts with a high pressure drop and large ducts with a small pressure drop. An initial figure for a commercial air-conditioning plant will be 0.8 to 1.0 Pa/m. This will permit higher velocities in the larger ducts with lower velocity in the branches within the conditioned spaces, where those may be more noticeable.

Pressure drops for proprietary items such as grilles and filters will be obtained from manufacturers.

An approximate total

system resistance can be estimated from the design average duct loss and the maximum duct length, adding the major fittings. However, this may lead to errors outside the fan power and it is safer to calculate each item and tabulate. Only the longest branch need be taken for fan pressure.

It will be seen that, where there are a number of branches from a main duct there will be an excess of available pressure in these branches. In order to adjust the air flows on commissioning, dampers will be required.



● Netalene linear strip grille.

PRODUCT REVIEW: GRILLES, LOUVRES AND DUCTING

ed in the branch ducts or, as is more usually provided, in the necks of the outlet grilles. The latter arrangement may be noisy, if some of these dampers have to be closed very far to balance the air flow, with a resulting high velocity over the grille blades.

The following notes are based on material submitted by the companies concerned.

Tru-Flow

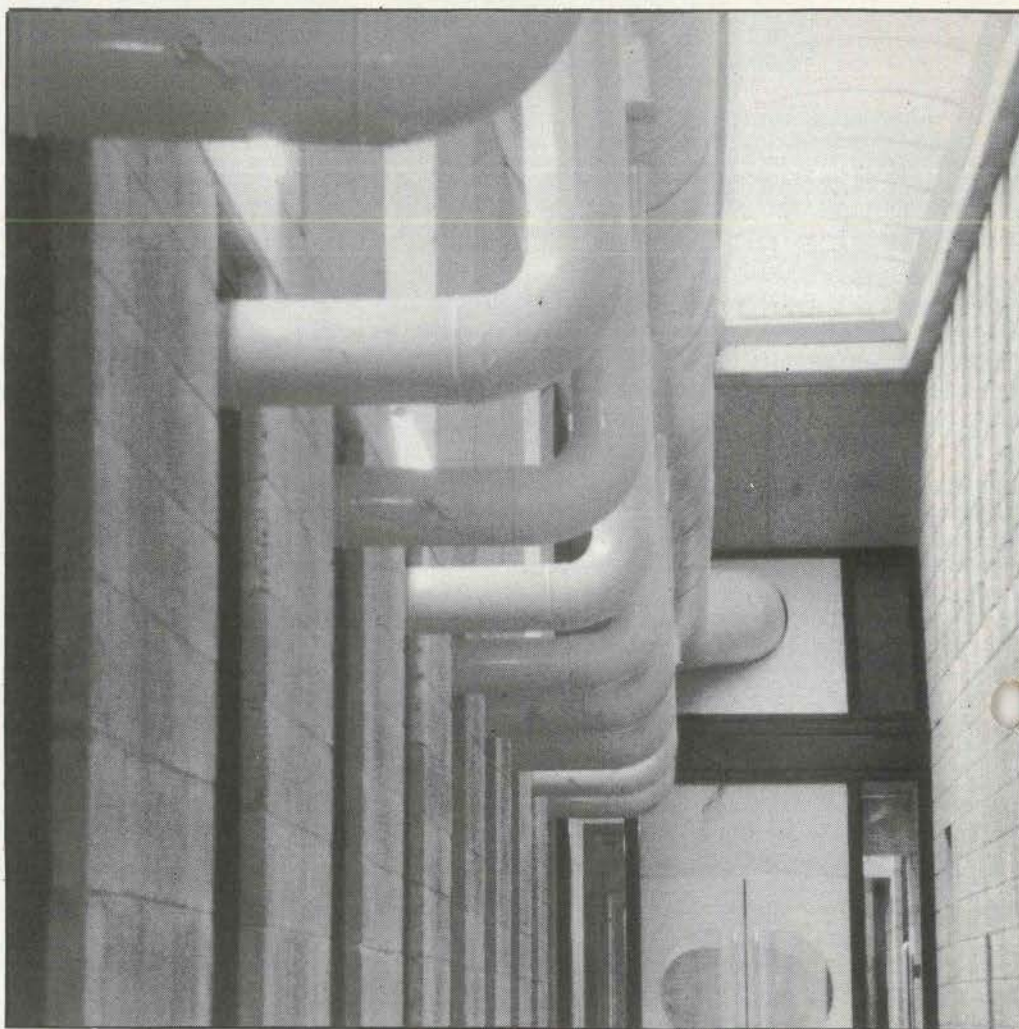
Tru-Flow Limited are now manufacturing Spiro tubing at their new premises at Unit 4, Crossbeg Industrial Estate, Ballymount Road Upper, Dublin 12.

Spiro tubing is a widely used product in the mechanical contracting field with a large range of uses such as ducting for high and low velocity air-conditioning systems, general ventilation, dust extract systems, twin walled flues and many other uses. It is generally regarded as a more economical job than the conventional rectangular ducting systems due to the lower cost of fabrication and installation.

Spiro tubing as manufactured by Tru-Flow is extensively used throughout Europe by Civil Engineers for the pouring of concrete columns, voids in concrete and sleeves for prestressed concrete. It greatly reduces the site costs for these operations because of the very considerable saving on labour, cutting out the need for the very time consuming process of shuttering.

Spiro tubes can be supplied in any lengths required and the gauge of the material ranges from 30 s.w.g. to 16 s.w.g. and from 3" diameter to 80" diameter.

Any further information can be had by contacting Tru-Flow 265984.



● A recent Tru Flow ducting installation at the new sports complex at UCD.

GKN Autoparts

GKN Autoparts offer a free design service to architects, consulting engineers and specifiers for ventilation problems. They also carry a very comprehensive range of Vent Axia and Helios ventilation units and accessories. These accessories complete the range of products and provides even greater flexibility in solving all kinds of ventilation problems.

Accessories ex-stock include: Roof plate assemblies (for flat or pitched roofs), soaker flange sheets to suit most profiles of corrugation, ceiling housing (for ceiling void or concealed ventilation), wall plates (fixed and removeable types), egg crate grilles, non vision door grilles and ex-

ternal weather louvres, PVC flexible ducting in sizes 102 mm, 178 mm, 229 mm, 254 mm, 305 mm, and 406 mm and the corresponding worm drive clips.

Adaptor kits for splitting Vent-Axia fans to accommodate a large fixing thickness between the two are also available. Four core white PVC cable is supplied in minimum lengths of 5 m.

A comprehensive ventilation manual can be obtained from Vent-Axia Division, GKN Autoparts (Ire) Ltd., Camac Close, Emmet Road, Inchicore, Dublin 8. (Tel: 781700 Telex: 30830.

Coolair

Coolair Limited of Dublin, specialists in air distribution equipment, are sole distributors in Ireland for Barber & Colman Limited, manufacturers of the world's most extensive range of air

distribution equipment.

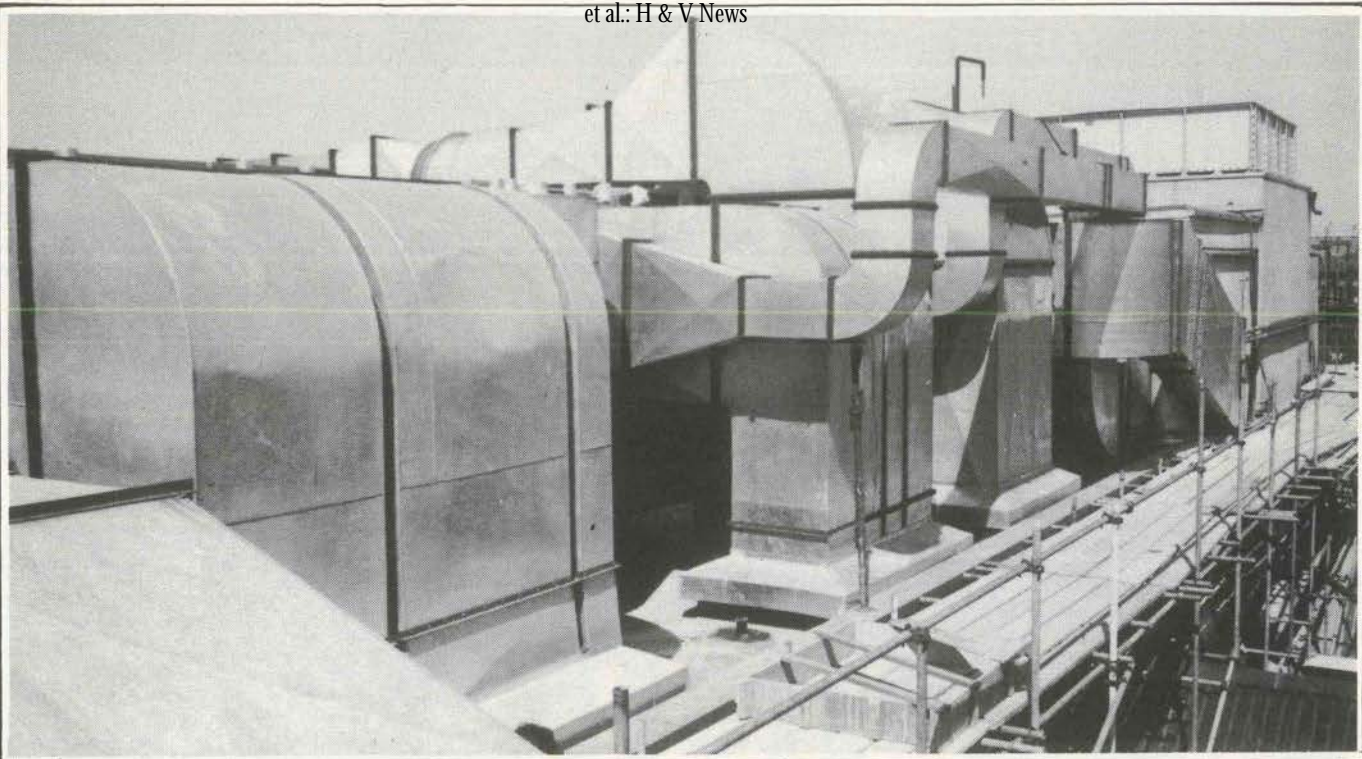
Accordingly, Coolair can offer the widest possible selection of louvres, grilles, diffusers, dampers, panels, terminal boxes and integrated ceilings to suit numerous applications.

Grilles:

Among the range of Barber & Colman ceiling grilles is the revolutionary continuous line diffuser Model CUD. This grille delivers the same volume per air foot as a conventional four slot diffuser and is designed to produce one or two-way patterns.

Ideally suited for use with variable air volume systems, a major advantage of the CUD grille is that air flow can be throttled down to complete shut-off without dumping taking place, thereby avoiding uncomfortable environmental conditions.

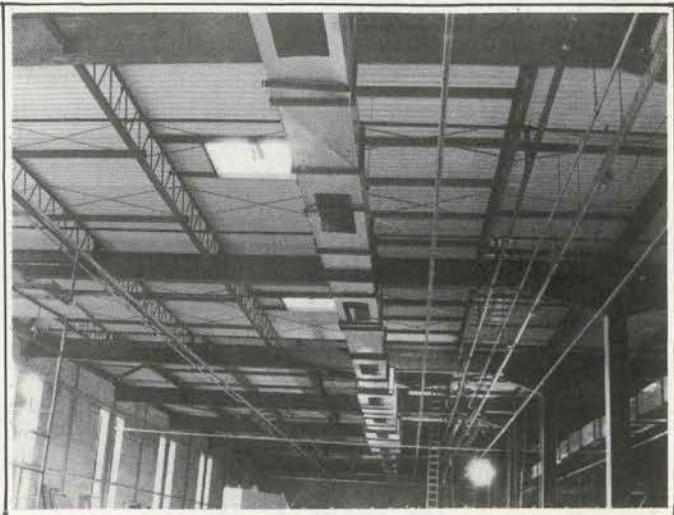
The CUD grille, which underwent extensive labor-



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PRODUCT REVIEW: GRILLES, LOUVRES AND DUCTING

atory testing is available in a variety of finishes including anodised aluminium and bronze with maximum widths of 76 mm. for one-way units and 121 mm for two-way units.

Coolair also have a wide range of grilles and diffusers suitable for both side-wall and ceiling applications. A recent addition to the range is a new Barber & Colman integrated ceiling system, which provides diffusers designed to integrate with various types of ceiling systems.

Louvres:

Coolair's choice of louveres comprises the Model DLF Sand Louvre and the Model DLO External Louvre. The Sand Louvre is designed to fit into air intake openings and perform initial separation of airborne sand and dust mixtures in sandy or desert locations. Constructed from aluminium extrusions, the Sand Louvre can be made from a minimum size of 300 mm wide x 300 mm high up to a maximum in one piece of 2,400 mm x 1,200 mm.

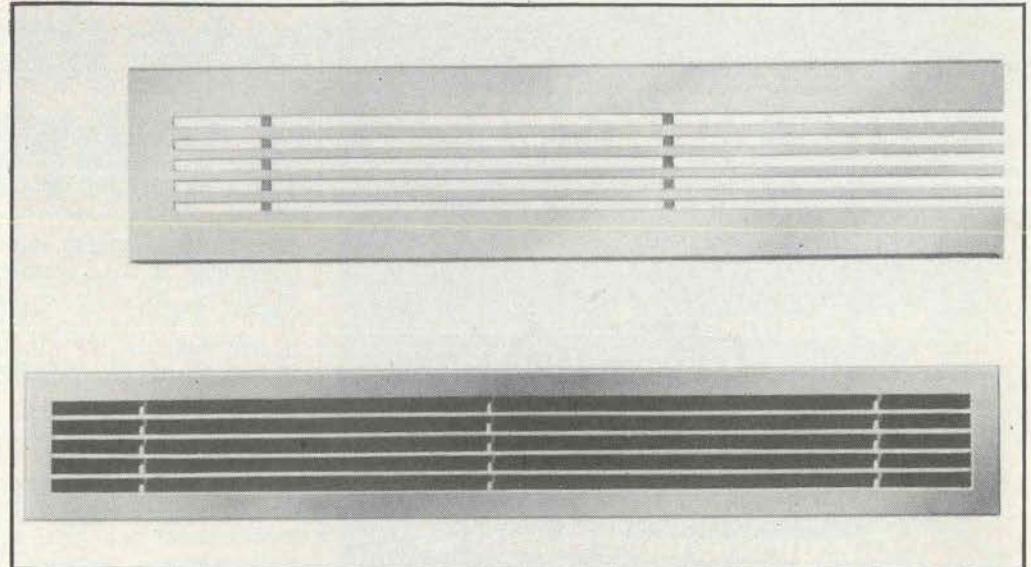
The External Louvre, also constructed from aluminium extrusions, can be used in any exterior wall opening where a continuous flow of supply or exhaust air is required, and can also be installed in any type of wall construction or at a duct terminal.

The design combines maximum free area with excellent weatherproof characteristics to allow a minimum ingress of rain water. The DL units can also be made up in the form of a door, complete with hinges and catches, for installation in plant rooms.

Ducting:

Included in the Coolair range of ducting equipment is the Model DRO Adjustable Balancing Damper and the Econ-O-Flow air conditioning terminals.

The Model DRO is a new type of damper in the form of a conical iris. It comprises an outer collar fitted with several blades which form an adjustable cone open at each end. This allows the aperture to be



● Myson ribbon line grilles from Finheat Ltd.

annular with the duct diameter and it remains annular from the minimum to maximum opening position, so ensuring a constant profile of air stream.

The Econ-O-Flow induction terminals select the correct amount of cool pri-

mary and secondary air to satisfy space cooling requirements at the lowest cost. Constructed of coated steel, the terminals are available in eight sizes from 130 to 3,200 cfm. to provide wide zone selections.

Further information on

the Coolair range of grilles, louveres and ducting equipment is available from: Coolair Limited, 25 Cookstown Industrial Estate, Talaght, Co Dublin, (Tel: 511244).



● Available on FRS 950 pipe insulation and both rigid and flexible duct insulation in a wide range of thicknesses, the finish satisfies Class 'O' of the Building Regulations. From Fibreglass Ltd.

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Finheat Ltd, sole agents/stockists for the full range of Myson/RCM grilles, diffusers, damper and regist-

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GRILLES, LOUVRES AND DUCTING

secondary duct dampers which are particularly useful for controlling air flow rates in small duct sections such as branch ducts or plenum connections. Types JOD and JRD can be used for controlling the air flow rate from terminal boxes positioned above a ventilated ceiling. All units, except JRD, can be supplied with fusible links to give a limited amount of fire protection.

Finheat's policy has always been to carry the maximum stock to suit demand and this policy has proven them right time and again which is mirrored by the response they are receiving from their customers, and on special specified contracts, they are fast gaining a name for themselves for speedy deliveries. These factors, together with the full support of Myson Group Marketing Ltd, ensure that Myson/RCM grilles will have an ever increasing demand in the future.

Further information is available from Finheat Ltd, at their new address, 17 Ushers Island, Dublin 8, (Tel: 778109/778120 Telex: 30751).

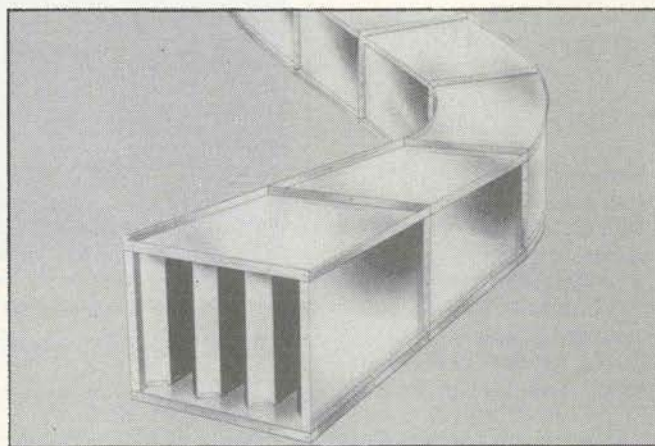
Eurenco

Eurenco Metals Ltd, an associate company of Eurenco Sales Ltd, has commenced business in ductwork fabrication. They are also manufacturing a range of louvres, grilles and diffus-

ers for the mechanical services industries. They have acquired extensive premises at 118-119, The Coombe, Dublin 8, at which enquiries may be diverted. Bertie O'Donnell, a highly regarded craftsman in the sheet metal fabrication business has joined the firm in the capacity of general manager. Further information is available at the aforementioned address.

Woodside Engineering

Woodside Engineering Ltd. are sheet metal fabricators and erectors, offering a high quality service to the mechanical services industry. Having established themselves as one of the leading sheet metal ductwork companies in Ireland, they recognise the need for a good service to the sheet metal industry. Using their experience gained over the years, they set about supplying a good quality range of accessories they knew was required by the industry. This was successfully achieved by introducing the Mez Flanging System now extensively used throughout Ireland. The Zone conditioning equipment also provides almost all the needs of a ductwork manufacturing shop and they keep a constant eye on improved products as they come on market.



● Bidelle S-Pak sound attenuators available from Unimack Ltd.

Flash Steam Recovery & Use

By Colm Moran

When Aer Lingus took over the old Roadstone factory for Airmotive (Ireland) Ltd, Colm Moran set about utilising the existing steam plant to its best use and in the process used the previously wasted flash steam in a flash steam vessel to recover this wasted heat. The following is a report on the project which was first presented at the May meeting of the Energy Managers Association in Jury's Hotel Dublin.



Introduction

The existing system in the old Roadstone factory as taken over by Aer Lingus consisted of two "Marshall" package boilers producing 8,600 lbs/hr of steam at 100 PSI. The maximum capacity from the boiler house is therefore 16.5 M BTU/hr. $8,600 \text{ lbs/hr.} \times 1,190 \text{ BTU/lb (hg @ 100 PSI)} \times 2 \times 0.8 \text{ (bm)} = 16.5 \text{ M BTU/hr.}$

The steam is only used for space heating, there is no process application. The heating loads were 6.2 M BTU/hr. in the high bay area 6.3 M BTU/hr. in the low bay areas Main Roadstone offices at the front - 1.5 M BTU/hr. Assorted offices within the factory - 0.5 M BTU/hr. Total: 14.5 M BTU/hr.

Refer Sketch 1.

In the high bay area the heating was provided by means of 9 larger

"Copperad" Jetstream wall mounted forced convection heaters and 5 suspended downflow unit heaters over the main entrance doors.

Refer Sketch 2

These 9 wall mounted units had a capacity of $\frac{1}{2}$ M BTU/hr. each and used 423 lbs/hr. of steam at 50 PSI. $(\text{hg @ 50 PSI} = 1180 \text{ BTU/lb})$. The 5 unit heaters had a capacity of 0.34 M BTU/hr. each and used 288 lbs/hr. of steam at 50 PSI.

In the low bay areas, the heating was provided by means of 31 suspended downflow unit heaters, Copperad manufacture. These had a capacity of 0.155 M Btu/hr. each and used 132 lbs/hr. of 50 PSI steam. They provided 4.8 M Btu/hr. of heating.

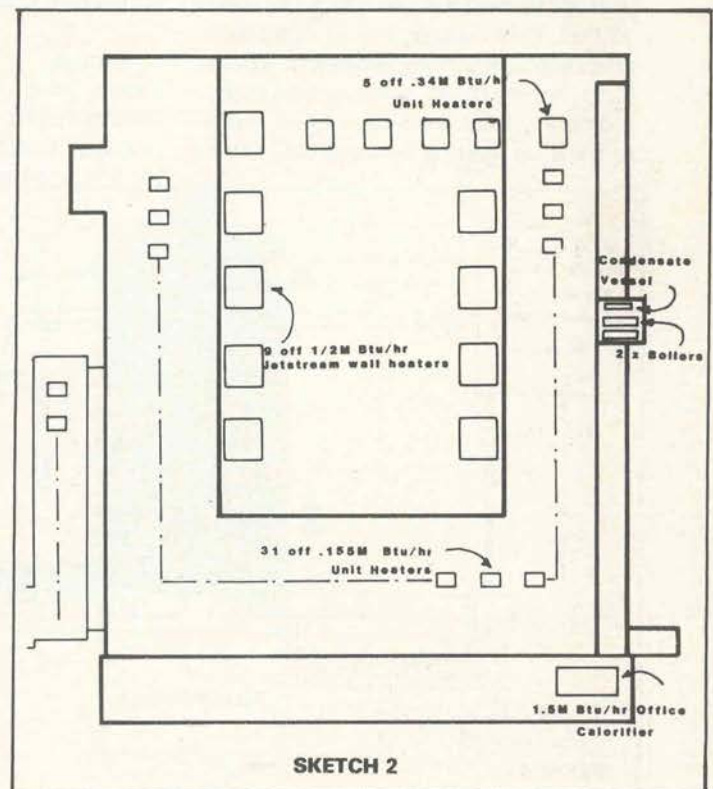
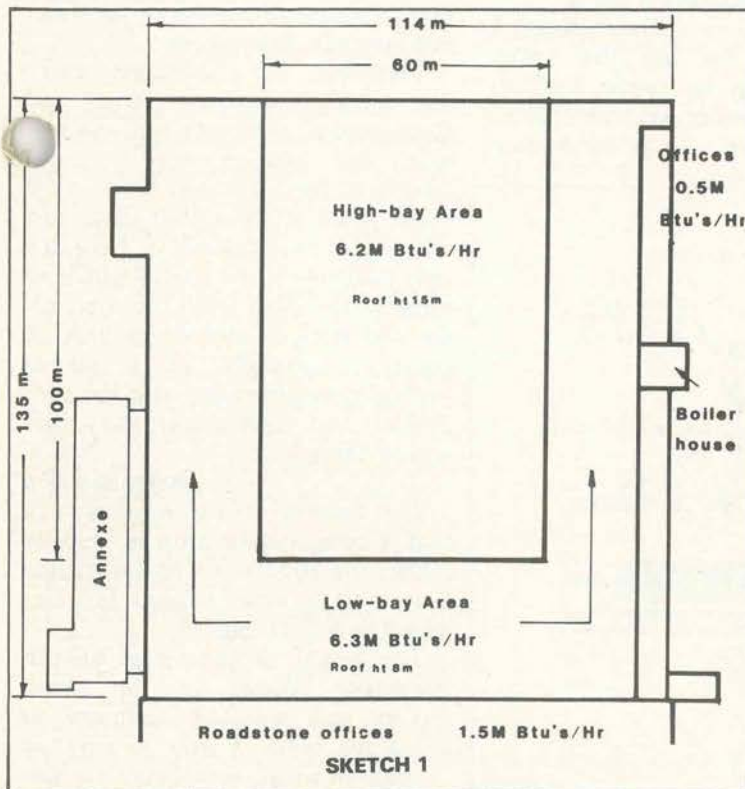
The remainder of the heating in the low bay areas was provided by gilled tubing fixed to the external walls at low levels in various isolated shops and offices. This consisted of ap-

proximately 80 linear feet of $1\frac{1}{2}$ " diameter tubing with 30 gills for foot and a rated output of 1,700 Btu/hr./ft.

The main Roadstone office block was fed through a steam-to-water calorifier manufactured by "Heat Transfer Ltd." The load was 1.5 M Btu/hr. and it used approximately 1500 lbs/hr. of 50 PSI steam. $1500 \text{ lbs/hr.} \times 1180 \text{ Btu/lb} \times 0.85 \text{ (Ef)} = 1.505 \text{ M Btu/lb.}$

The water circulated through radiators in the offices. Control was effected by means of a motorized valve on a bypass line which returned the hot water directly to the rads rather than into the calorifier. There were also 4 domestic hot water calorifiers for washing etc. and various other small convectors in wash-room and the like.

Now, the live steam was circulated via a 4" diameter ring main at high



ZONE

level (approximately 35') to the wall mounted heaters and the unit heaters. The boiler man had traditionally reduced the pressure to c 50 PSI before entry into this main.

Refer Sketch 3

The condensate was collected into a 2" diameter ring main also at high level and returned *under gravity* to the condensate vessel in the boiler house. This vessel was vented to atmosphere.

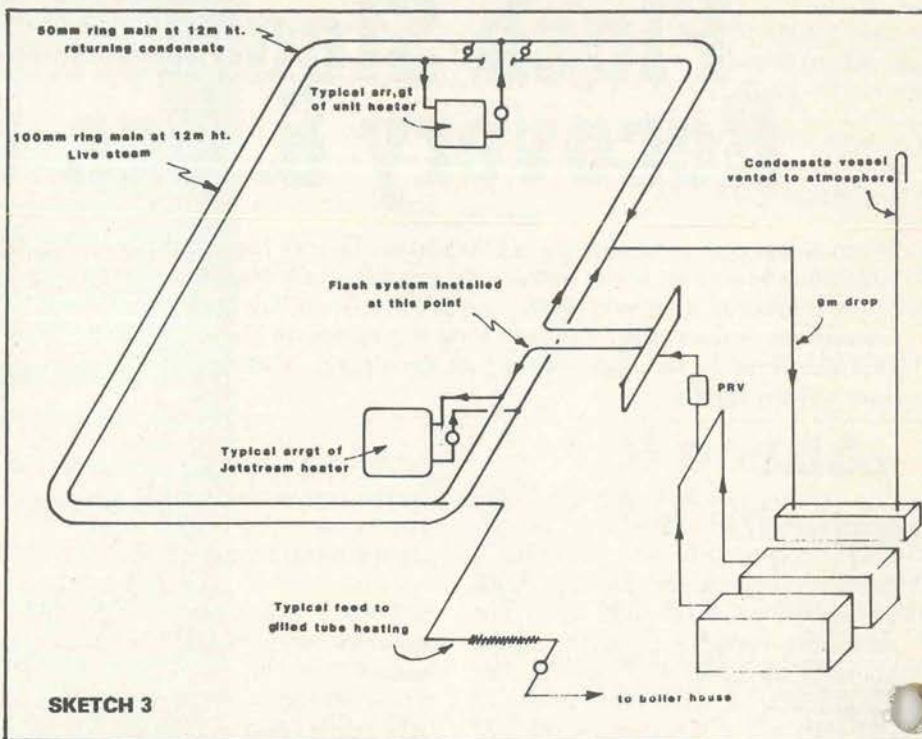
Installation

Essentially, all we did was to re-route the return condensate ring mains into a flash recovery vessel mounted at high level and right beside one of the large wall-mounted $\frac{1}{2}$ M Btu/hr. heaters. We disconnected the live steam supply and fed this unit with flash steam recovered at 5 PSI.

In other words, we hoped to run this heater "for free". If the total heating load is 14.5 M Btu/hr., running this $\frac{1}{2}$ M Btu/hr. heater "for nothing" represents a saving of 3.5% on fuel bills.

We did not pick up the grilled tubing condensate nor any of the items with temperature control such as the domestic hot water calorifier etc. — these were considered to supply too erratic and fluctuating a supply of condensate.

When Aer Lingus changed the layout of the factory and installed new process equipment it was necessary to provide 8 new air handling units of 15,000 cfm. capacity to ventilate areas such as plating shops etc. These units were fitted with team coils. However, they were envisaged more as back-up heating because they drew



in outside air rather than circulate indoor air. Because of this, we also fed the condensate directly back to the vessel in the boiler house.

So, the installation consisted of a size 12 Spirax Sarco Flash Recovery vessel located right beside the heater in question and all as for the attached sketch.

Refer Sketch 4

Principle of Operation

Consider any of the unit heaters operating on live steam at 50 PSI. The saturation temperature is 298°F.

Refer Sketch 5

Because of the fact that when steam gives up its latent heat to condense into water, its temperature remains constant — the condensate

being discharged through the trap has a boiler temperature of 298°F.

However, it will only remain as water if it sees a constant pressure of 50 PSI. But, the condensate return main is at atmospheric pressure where the boiling point of water is 212°F. Therefore, the situation is that water at 298°F is being discharged through the trap orifice into a condition where it cannot exist as water at a temperature above 212°F. So what happens?

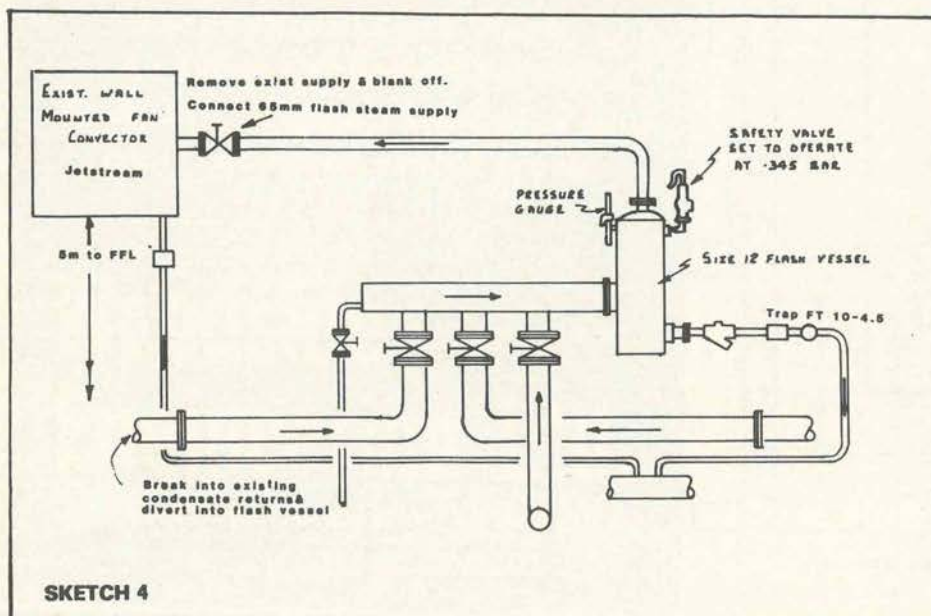
The surplus heat in the high temperature water reverts into latent heat re-evaporating some of the water into steam i.e. flash steam.

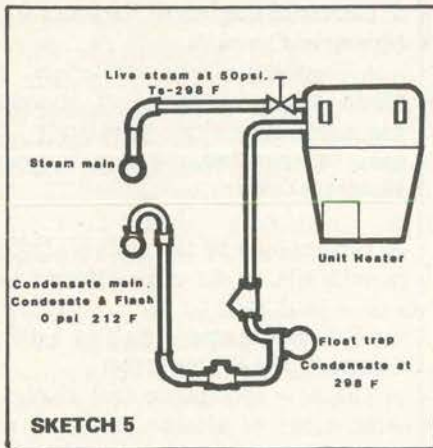
Therefore, the condensate return line carries condensate (water) and flash (steam). Without a recovery system, this mixture was returned directly to the condensate vessel in the boiler house and the flash steam just vented into the atmosphere. Now, the only function of the flash vessel is to separate the flash from the condensate and apply it usefully as heat. It consists essentially of a simple vertical pressure vessel with the condensate and flash steam entry part way up the side.

Refer Sketch 6

The diameter of the vessel is such that a considerable drop in velocity allows the condensate to fall to the bottom of the vessel where it is drained out by a float trap.

The height of the vessel has an important bearing on the steam quality and must be sufficient to avoid the outlet Vortex picking up droplets of water, which may rise into





the steam space of the vessel by splashing.

However, it is only a very simple vessel with no real controls, motorized valves etc. and no internal mechanical moving parts at all. Our particular unit is quite small, 12" diameter by 38" high.

Basis for Selection

8 Jetstream heaters at 423 lbs/hr. of live steam = 3,384
 5 unit heaters over entrance doors at 288 lbs/hr. = 1,440
 31 smaller unit heaters at 132 lbs. = 4,092
 Roadstone office calorifier = 1,500
 Total condensate load = 10,416 lbs/hr.

Now, the condensate from the 50 psi system has a sensible heat $h_f = 267$ Btu/lb.

at 5 psi $h_f = 196$ Btu/lb.

Difference = 71 Btu/lb.

This difference of 71 Btu/lb. is the surplus heat which reverts to latent heat in re-evaporating some of the condensate. At 5 psi, steam has a latent heat content $h_{fg} =$ Btu/lb.

The amount of flash formed at 5 psi = 0.0739 lbs of flash per lb of condensate.

This represents a theoretical saving of 7.4%. However, considering 10,000 lbs/hr. of condensate implies 739 lbs/hr. of flash steam recovered. Total heat of steam at 5 psi $h_g = 1156$ Btu/hr.

Heat recovered is $739 \times 1156 = 854,284$ Btu/hr.

Even allowing for only 60% efficiency, this is more than adequate for the $\frac{1}{2}$ M Btu/hr. heater into which the flash vessel feeds.

This is $\frac{1}{2}$ M Btu/hr. recovered over a total load of 14.5 M Btu/hr. represents a real saving of 3.5%.

Cost Analysis

The material costs were £515 and the installation costs were £700 — Total £1,215.

Size 12 Flash Vessel	- £278
Pressure Gauge	- £14.25
Safety Valves	- £87.00
Strainer	- £10
Trap	- £102
Sight Glass	- £23.75

From the tables below, the oil usage for the 80/81 heating season is c. 67,000 gallons with the flash vessel in commission. Without the flash vessel it would have been 69,500 gallons.

Oil Usage

Winter 78/79 — gallons

Jan '79: 17,264
 Feb '79: 23,400
 Mar '79: 15,752
 Apr '79: 10,772
 May '79: 8,200
 Tot. 75,388

Winter '80/81 - gallons

Sept '80: 900
 Oct '80: 4,400
 Nov '80: 8,100
 Dec '80: 9800
 Tot. 23,200

Jan '81: 12,650
 Feb '81: 11,850
 Mar '81: 6,700
 Apr '81: 7750
 May '81: estimate at 5000
 Tot. 43,950

Overall 67,150

96.5% = 67,150 gallons

100% = 69,586 gallons

Savings = 2,436 gallons @ 64p = £1,559

The difference between the five month post Christmas periods of 1979 and 1981 are not only attributable to the flash system. All the traps in the plant were also renewed and thermostats were fitted to the fans on the "Jetstream" and unit heaters.

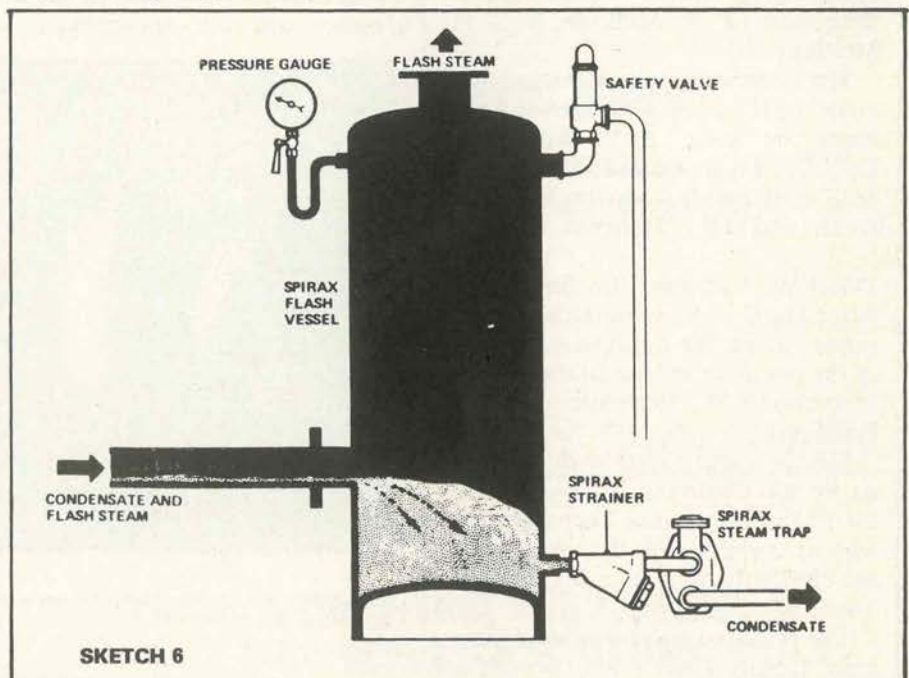
Conclusion

First, the savings speak for themselves. However, in addition to the very short pay-back period which is based on extremely conservative estimate (60% efficiencies etc.) there are other advantages to a flash system.

It saves on water treatment and consequent blowdown in the boilers. This is very obvious more especially from the Naas Road, where before this installation one could always see quite clearly a cloud of steam over the boiler house. This evaporation of treated water does not occur any longer.

It is a really simple, straightforward installation — no moving parts. There are absolutely no operational problems. Even on start-up it can handle heavy condensate loads. After it is installed, it may be completely forgotten about other than for routine trap maintenance.

Finally, it is a very small and neat installation. As I mentioned before, measuring only 12" x 38" high and located right next to one of our heaters it is particularly gratifying to see it feed this unit with steam which otherwise would be going literally "up the spout".



The committee of the Northern Ireland Branch of the Institute of Mechanical Engineers paid a visit to their counterparts in Dublin.

The Northern Ireland party met the committee of the Irish Branch at the headquarters of IIRS at Ballymun when both parties were welcomed by Martin Cranley, Director General of IIRS who afterwards hosted the lunch.

Following a tour of IIRS by the menfolk while the ladies were visiting the textile testing house at Finglas, the two committees met for a brief meeting at the HQ of the Institute of Engineers when the NI part were officially welcomed by the Republic Chairman, R P Grainger.

During the evening both parties and their wives came together again for an informal dinner at the Tara Towers Hotel.

On the Saturday morning the Port of Dublin Docks Board were hosts and took those present on a guided tour of the port and harbour following which Mr Bob Hayes, General Manager of the Board once again acted as a generous host while answering questions about the port activities.

At the conclusion Mr Charlie Hicks, NI Chairman, thanked Mr Hayes and the Mr Grainger for their hospitality during the two-days and expressed the wish that maybe next year the Southern members would enjoy the hospitality of the Northern Ireland Branch.

The Northern Ireland party consisted of Mr C Hicks (Chairman), Professor Blair C L Laird, D Clements, B Turner, P Walters, G Dickinson, F R McBride & J H McClean.

The Southern Ireland party were made up by R P Grainger (Chairman), Dr Kelly, A W Burnell, P Collins, F Keogh, Professor W Scaiffe, D Syme, J Martin, E Prendergast, and M B O'Donovan.

Following tradition, the Strangford Arms Hotel in Newtownards was the venue chosen for the Annual Dinner of the Northern Ireland Branch of the Institution of Domestic Heating Engineers.

Members and guests were welcomed by the Chairman of the branch, Mr Philip Johnston of Thom Heating who was supported at the top table by the Northern Area Sales Manager of Thom, Mr Ed Martin.

The principal guest was Mr J Gorman, Deputy Chief Executive of the

Northern Ireland Housing Executive who in his speech, paid tribute to the members of the Institute for the support they had given the Executive over the years.

The Hon. Secretary, Mr Brian Page was in charge of the excellent arrangement and must feel very pleased at the warm reception given to and the pleasure given by the artists he had chosen to provide the after dinner cabaret.

John Kelly Ltd, Agencies Dept, 23 Station Street, Belfast, have been appointed NI distributors for Brencede Ltd the nationally known mechanical handling experts.

Specialising in the use of worms and scrolls, particularly for coal handling, the systems are neither labour intensive nor expensive while at the same time they can provide full automatic control. Ideal for application in schools and commercial premises, Brencede provide a design service and will be pleased through their agents and distributors to assist anyone interested in the application of mechanical handling to the transfer of coal from bunker to boiler.

Congratulations are due to Mr Jim Haddow on his appointment as

Chairman of the Heating, Ventilating & Domestic Engineers National Joint Industrial Council.

A frequent visitor to Belfast, Mr Haddow is a Director of Vaughan Mechanical Services (Scotland) Ltd, part of the Belfast-based Vaughan Holdings Group.

A further sign of the return of commercial life to the city centre of Belfast is indicated by the opening of a new kitchen centre — Belfast Kitchen Centre Ltd in Bridge Street.

The new showroom will display a wide range of kitchen furniture and appliances including the well known Arco and Neff ranges of products for which the company have been appointed merchants. The persons behind the new enterprise are the two principals of A.S. Heating Plumbing & Electrical Services Ltd, Mr Sam Andrews and Mr Richard Stead together with Mr Fred McCrea.

Crouzet Appoints New Distributor

To strengthen its sale of its automation components in Northern Ireland, Crouzet Limited, of Farnborough, Hampshire, has appointed the electrical and mechanical specialist distributor, A E J Hurst Limited, to handle the company's products in the province.

Based in Newtownards, County Down, A E J Hurst Limited have responsibility for selling Crouzet's complete range of electronic and electromechanical timers, switches and counters. These advanced, yet cost effective components have wide application throughout industry and consumer products — from sophisticated process and environmental c



● Pictured at the recent IDHE Dinner were (L-R) B Montgomery; I Morrison; D Sweeney and P Mawminney.

rol systems to electronic washing machines for the housewife.

Crouzet's operations in Ireland are co-ordinated from Dublin by regional sales manager Jack Clarke who explained the background to the new business agreement. "Form some time now", he said, "our products have been selling consistently in Northern Ireland. However, we are confident that the time and opportunities are now right for us to go for considerable growth in the province and, indeed, throughout Ireland as a whole. For these reasons, we are increasing our representation in the country by appointing more distributors."

Established in 1935, A E J Hurst operate both in Northern Ireland and in Scotland where they have a branch in Glasgow. In addition to being a distributor, the company also offers a complete design service in bus-bar linking distribution systems in conjunction with its franchise principals and also specialises in supplying large water and sewage pumps.

One of the most significant contracts carried out by the Northern Ireland company has been to supply a complete electrical distribution system for the new DeLorean sports car plant in Belfast.

IDHE News

The Ulster branch have held two of their early social events of 1981. On 23 April they took a party of 50 golfers and couples to Stranraer for a days sport with 50 counterparts from Scotland.

A great day was had by all which was sponsored by DBC Ltd.

Bob Dillon qualified on the days golf to play in the final of DBC Ltd Group UK Golf Tournament at Harrogate in July.

Helens Bay Golf Club was the venue for the first of five golf days the Institute has in 1981.

The prizes were presented by UDT Ltd. Forty people enjoyed the golf and meal afterwards.

Winner — Moore Bent Esq, 40 pts.
Runner-up — George Montgomery, 39 pts.

AGM of Ulster Branch Mace bearers appointed: Chairman — Philip Johnston; Vice Chairman — Billy Hunter; Hon. Sec. Hon. Treas. — Brian Pope; Committee: Ian Morrison, Peter MacInerney, Billy McMichael, Isaac Reid, Charles Turner, Bob Montgomery, Maurice Stevenson.

WHO REPRESENTS WHOM? 1981/82

The publishers of IRISH HEATING and VENTILATING NEWS are compiling a directory of manufacturers, agents and distributors in the H & V trade. Its lists of suppliers of goods to the market in Ireland will make this yearbook a valuable reference for merchants, contractors, consultants, architects and engineers alike.

Questionnaires have already been distributed to principals, agents and distributors and these should be returned immediately. Additional copies of the questionnaire may be had on application to:

WHO REPRESENTS WHOM?

Irish Trade and Technical Publications Limited
5/7 Main Street, Blackrock, Co. Dublin. Phone: 885001.

CLOSING DATE JULY 24th, 1981

**THERE IS NO CHARGE FOR LISTINGS IN
WHO REPRESENTS WHOM?**

NEW PRODUCTS

Auto Flush — Money Saver

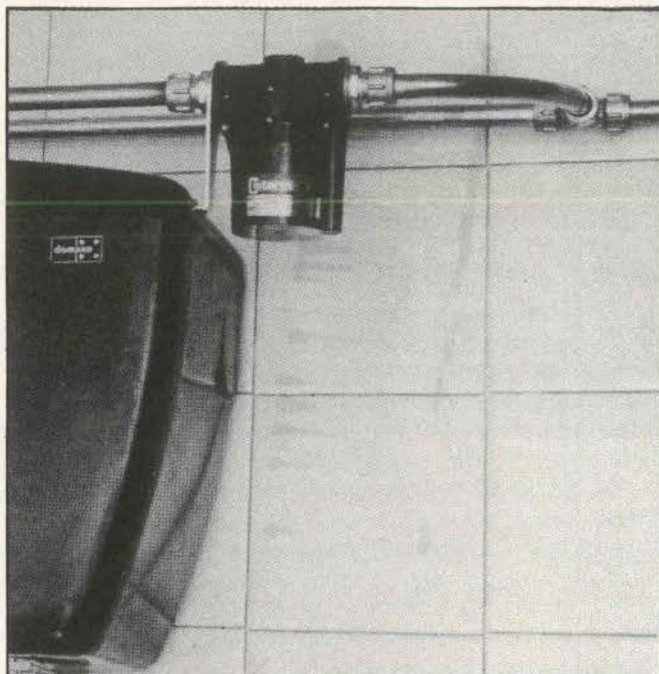
Three quarters of the water currently being flushed down the nations automatic urinals can be saved by a control valve just launched on the Irish market by a new company — Premier Building Products, Kilmacud, Co Dublin.

The new product called Cistermiser costs approx £70 is so designed that superfluous flushing of urinals at night or when the premises are not in use is impossible. At present automatic flushing urinals are set to activate every 5-10-15-20 minutes. Each urinal three gallon cistern uses an estimated 78,840 to 315,360 gallons of water a year depending on which cycle duration they are on.

The new product has been tested and approved by Dublin Corporation Waterworks department. The Cistermiser valve only allows water into the automatic cistern after someone has used a tap or hand flushed a toilet in the same system. This means that the automatic flushing system is only activated when there are people about, so that at night and weekends flushing office block urinals, for instance, do not flush.

This comments Premier Building Products director Kevin O'Malley is also a safety aid in that water damage from blocked urinals cannot happen when there is no one in the building. But there are water savings during the buildings ordinary busy periods as toilet usage peaks at predictable times and less water is used in between.

O'Malley says that the Cistermiser has been approved by the British National Water Council



● The new Cistermiser flush control valve from Premier Building Products.

and is of immediate interest to hoteliers and publicans and commercial property owners who have to pay for their use of water.

He says when — as in some places water is costing from 60 pence per 1,000 gallons — a reduction of anything from just under

300,000 gallons to 58,000 gallons on a single three gallon urinal tank is possible, the Cistermiser makes great sense.

The product has enjoyed considerable success in Britain where one Council claimed it saved them £8000 in water rates and one pub

chain claimed Cistermiser saved 84 per cent of its previous water usage.

The Cistermiser earlier this year was awarded a Building Innovation award but more importantly O'Malley claims it can pay for itself in the first year of installation.

Further information from Premier Building Products, 15 Lakelands Close, Kilmacud, Stillorgan, Co Dublin, (Tel: 887348).

New Open Fire from Taney

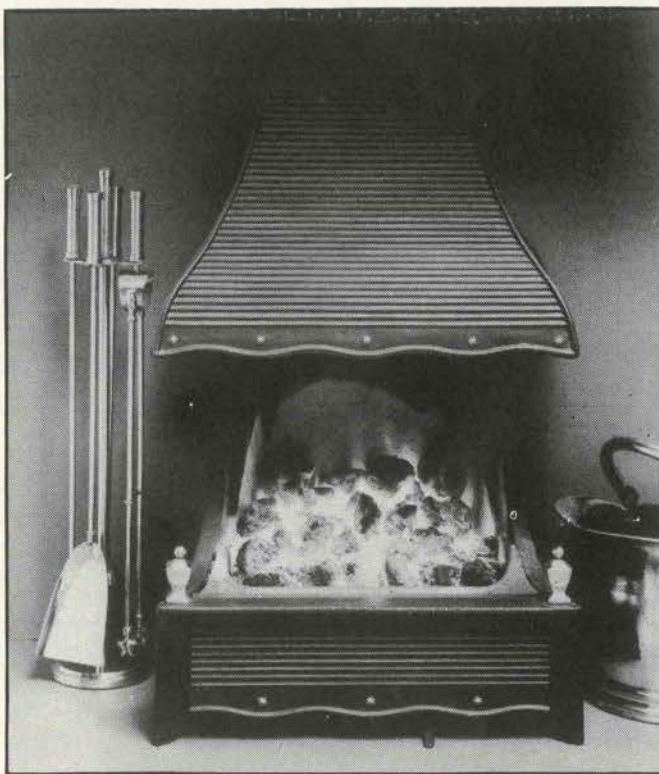
The classical Rayburn Open Fire from the Aga-Rayburn division of Glynwed Appliances Limited will be available shortly from Taney Distributors, with a choice of the distinctive new brass finials and star motifs as well as with traditional bright trim.

Designed and built by craftsmen, the Rayburn Open Fire stands in a chimney recess away from the wall and surrounding brickwork to heat by convection as well as radiation.

Several important modern design features are incorporated into the Rayburn Open Fire. An adjustable plate concealed in the canopy restricts the size of the chimney opening to lessen heat wastage, save fuel and minimise draughts. A small lever, set below the decorative front, controls the rate of burning so that the Rayburn Open Fire can be left to burn, unattended, for long periods. The decorative front also conceals the large ashpan which only needs emptying once a day.

The Rayburn Open Fire, available in two sizes — 16" (400mm) and 18" (450mm) — requires recess 36" (915mm) minimum height by 14" minimum depth. Recommended width is 4" (100mm) clearance on both sides of the canopy.

Under normal winter



● The new Rayburn Open Fire from Taney Distributors Ltd.



● Growing demand has encouraged Ideal-Standard to complement their highly successful range of Dualux brassware with a roll-mounted bath filler (pictured here). Dualux fittings — based on the revolutionary ceramic disc valve principle and introduced a year ago — are available in either chrome or gold-plated finish. Roger Cooper, Ideal-Standard's marketing director, said: "Since we introduced Dualux we have been under increasing pressure to offer a bath filler only, particularly for installations in which there is a separate shower arrangement."

conditions, the fire uses an average of 1 ¼ cwt (45kg) of coal or manufactured solid fuel (such as Coalite, Rexco etc) to heat a room up to 2500 cubic feet (71m³).

For further information contact Andy Kavanagh or Pat Gaffney at 508120.

Armitage Shanks 'Superten'

A new development in bath creation, a 10mm bath. Made from 10mm capped acrylic, the Ensign "Superten" is a 1700mm plain (no hand grips) bath. The Ensign Twingrip "Superten" is also available in white Groups 2 and 3 and will replace the existing composite bath in these colours, together with the 1700mm Ensign 8 (white only).

Superten conforms to BS 4305 (1972) where applicable, and of course, has an all-metal frame. It is gradually replacing the composite Ensign. Selling at the same price, and the colour Sunking and Avocado, are already with the merchants. The reaction to this colour is fantastic according to Armitage Shanks. Acrylic baths now represent 60 per cent of bath sales.

Low Cost Sound Level Meter

Dawe Instruments Limited, have introduced into their range the 1408F, an inexpensive Type 2 Sound Level Meter, with facilities which

will prove invaluable for a wide range of applications including measurement of environment noise and assessment of occupational noise deafness risk in industry.

The instrument complies with the requirements of IEC 651 the consolidated revision of earlier international standards and soon to be published as a British Standard. It therefore exceeds the requirements of BS 3489 and ANSI S1. 4 Type 2.

The wide range of 30 to 120dB is covered in three overlapping ranges, with both A and Flat (Linear) frequency characteristics selectable.

Fast, Slow, Impulse and Maximum Hold time-weightings are provided to enable the instruments to measure steady, varying or short duration sounds. The maximum hold facility with a decay rate of less than — 1dB over 5 minutes, is particularly suitable for measuring the r.m.s. level of intermittent or short duration sounds.

An a.c output is provided to feed tape recorders and frequency analysers.

The instrument can be

supplied in a carrying pouch or in kit form which includes an acoustic calibrator and windshield contained in a compact carrying case.

For further information please contact Eoin O'Riain at Industrial Instruments Ltd.

New Mini Drop Head

Combex Engineering have recently announced a new, compact, drop head threader kit for the plumbing, heating, ventilating and site service markets.

The threader is manufactured by Virax UK Ltd, suppliers of pipe bending, threading and working tools.

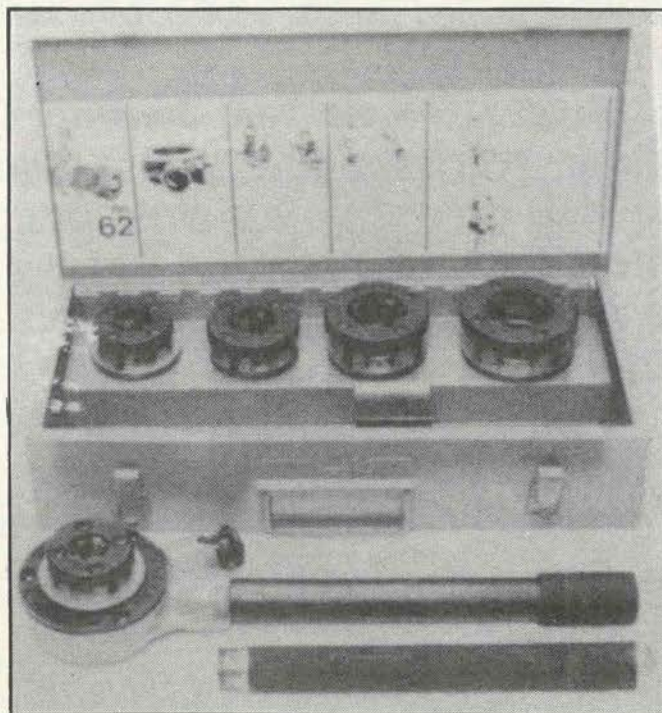
The Mini Drop Head ratchet threader kit is available in two forms: Type 62B covers the five most popular threading die sizes of ¾, 1, 1 ¼ and 1 ½ in BSP or API. Type 62C is smaller still, incorporating only ½, ¾, 1 and 1 ¼ in sizes.

Each set comes with collapsible die holder in its own steel carrying case with twin clasps and a metal carrying handle. Preset dies nestle in apertures within the box to aid speedy selection and to avoid damage.

Diestock handles now have a durable black non-slip easy-wipe finish. One handle is unscrewed for transport and the two parts are securely clipped inside the front of the box.

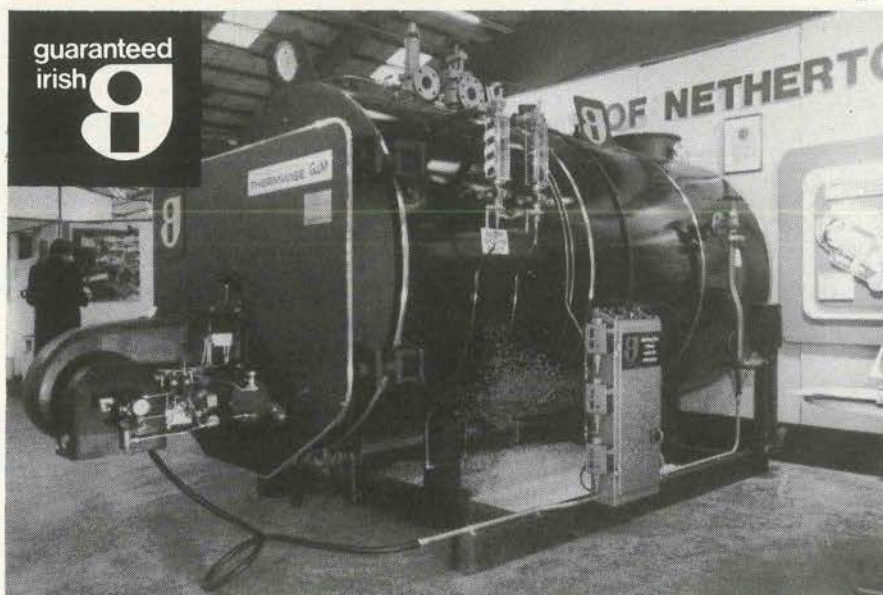
Weighing 8 kg (18 lb), the kit measures approximately 350 x 150 x 80 mm (16 x 7 x 3 in).

Further information from: Combex Engineering Ltd, 3 East Road, Dublin 3, (Tel: 748374 Telex: 31319).



● The new Virax mini drop head threader.

Meet the Thermwise Family



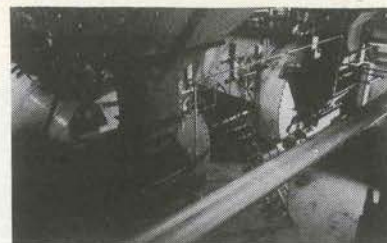
Boilers Manufactured from 500 to 10,000 lbs per hour
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Agents for Danks of Netherton **Unusual Fuels.**



General Industrial Marine Boilers

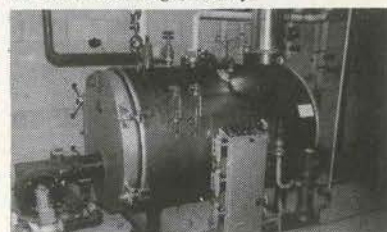
Frankfort, Dundrum Road, Dublin 14 Tel.: 989921, Telex 30870



Two turf fired 12,000 lbs/hr steam boilers installed in St. Lukes Hospital Clonmel.



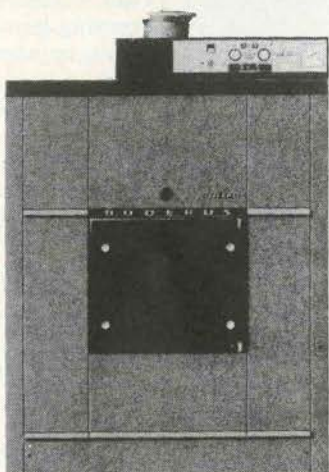
Thermwise M.T. H.W. boiler installed in the P&T Exchange, Santry.



L.P.G. boiler installed in metal spinner Newtownmountkennedy.

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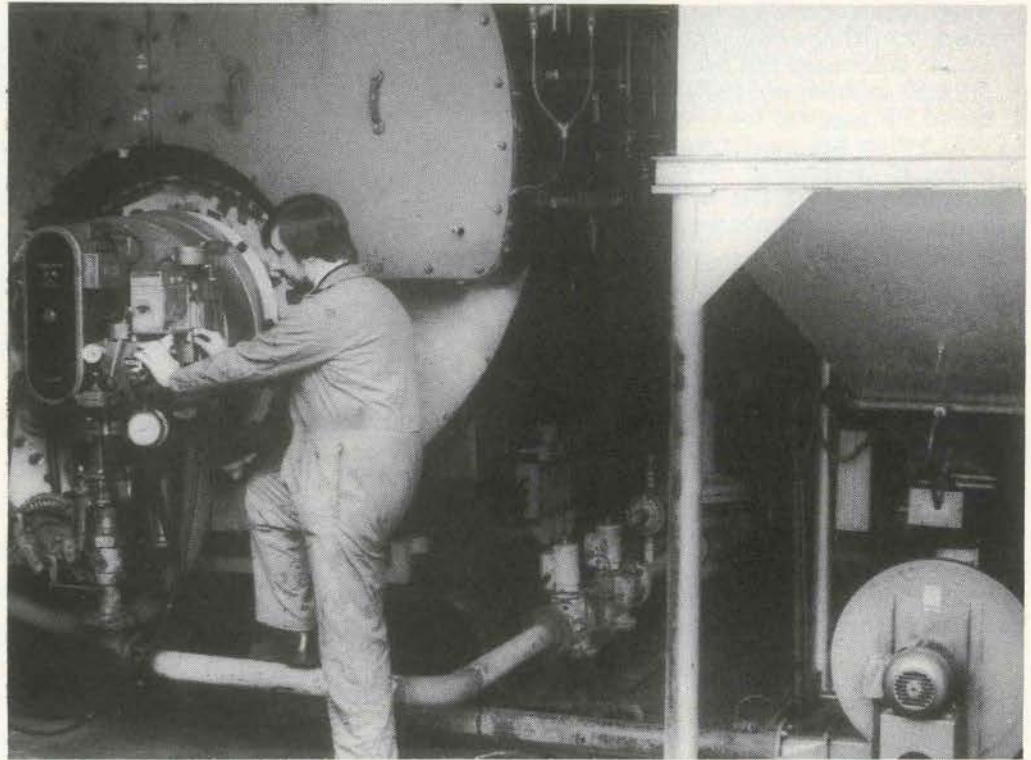
BOILERS

NEW COAL BURNING SYSTEM

The industrial heating market is one which by its very nature is subject to the ups and downs of the money and property markets but apart from these factors other influences have come to bear on the market over the last few years. The first major upheaval was the oil crisis and it was generally expected that there would be an almost total change to solid fuel but as heard recently at an Energy Managers meeting this has in fact been slower than expected, although there is now an even greater interest in solid fuel and some large orders are expected to be placed very shortly. What should not be overlooked is the real danger that total dependance on one fuel is still very bad for the country and it is to be hoped that long term planning will take this into account. As far as natural gas is concerned it seems to hold at least a part answer to our problems as it is at least a nature fuel and no matter what the expected life of the supply may be twenty or a hundred years it should be used to its full potential in industrial space heating where it will be at its most efficient leaving oil for other industrial uses in industries like plastics, textiles etc.

NEW COAL BURNING SYSTEMS

With the need to remove our dependance on oil at least one major creamery in the country is considering a new coal burning system. The following is an article describing the system. Hamworthy Engineering Limited (a member of the Powell Duffryn Group) have now successfully developed a system for firing pulverised coal using



● Hamworthy triple fuel burner. Pulverised service hopper at right.

the Hamworthy AW gas/oil burner. Even existing plant can be converted with only slight modification.

This break-through has been made after considerable research into coal combustion processes including fluidised bed techniques.

The big advantage of the Hamworthy system is that unlike other methods the triple fuel features does not reduce the full rated capacity of the boiler. It is believed that this burner is the ideal answer to shell boiler users who either already have a Hamworthy AW burner or who wish to invest in plant with complete option on the three basic fuels.

The triple fuel burner has a specially designed nozzle for the admission of pulverised coal which is burned simultaneously with a limited quantity of oil or gas.

Using pulverised fuel (PF) in a completely closed

system the Hamworthy burner gives the following advantages:-

1. A full load operation with a coal/oil ratio of 70/30.

2. True dual or triple fuel operation with the same unit requiring no physical changes, giving instant selection from and to gas or oil only/combination.

3. No loss of efficiency. The full furnace area of the boiler is employed since the design does not involve the insertion of equipment into the fire tube. This produces a balanced heat distribution which is not possible with conventional stokers.

4. Fully automatic controls can be used making the plant comparable to oil or gas firing.

5. Use of combined fuel flame ensure no flame monitoring problems.

6. Load turn down/air fuel ration control and response to load changes

are comparable with oil/gas firing.

7. Completely sealed coal storage/transport system giving clean boiler house conditions comparable to oil firing.

8. No additional manpower required.

9. Virtually no "down time" required for de-ashing. The fly ash produced by PF will be carried to the boiler exit.

10. Large coal stocks on site not necessary. Non degrading oil may be stored against fuel delivery problems.

Existing Systems

The disadvantage of existing methods for coal firing on shell boilers are generally accepted. Moving grate and stationary grate stokers are acknowledged to have severe limitations, they tend to be labour intensive, they need stock pile and conveyor systems, are difficult to automate, slow to respond to load variations and involve

BOILERS

substantial boiler downrating.

Fluidised bed is a new technology still with many problems to solve and must be economically and technically questionable as an "odd-on" unit to existing boilers. Pulverised fuel is very widely used on water tube boilers, has a quick on/off response and can be automated but is difficult to monitor. The use of PF as a fuel for shell boilers has previously presented enormous operational difficulties.

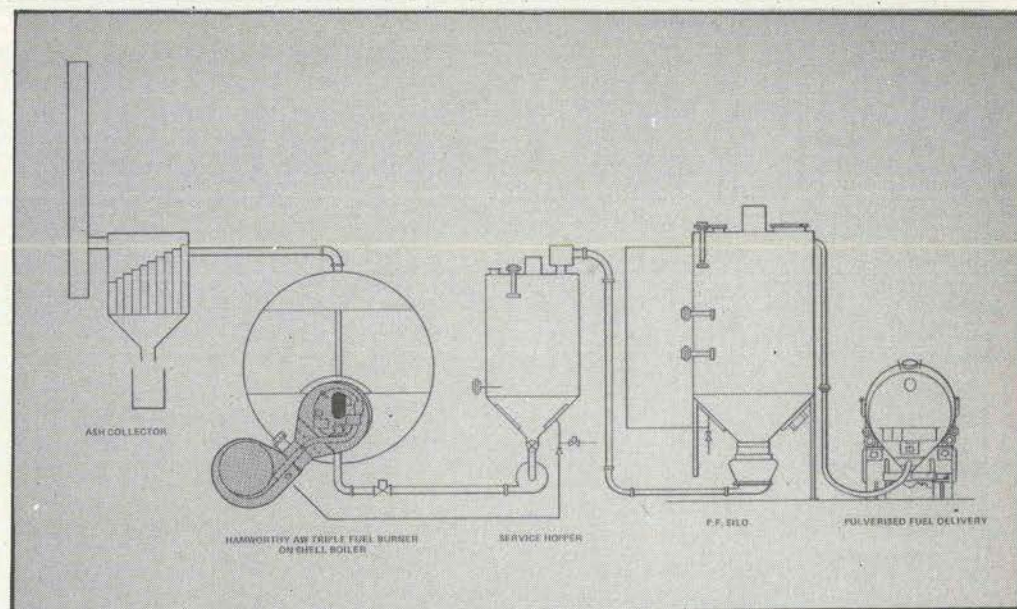
A PF/oil slurry mixture is another possible approach but has a number of shortcomings. In its simplest form the fuel is very unstable and has much more limited coal/oil ratio, also gas cannot be used as an alternative to oil.

Development of the Hamworthy System

As it was obvious (and established by PF/oil slurry experience), that 100% evaporation could never be obtained on current oil/gas fired boilers with coal in the form of washed singles/smalls, pulverised coal presented the only possibility of matching the duty obtained by gas or oil. But to achieve this, the coal must be burnt in a manner similar to an oil flame ie, the flame must contain a rapid ignition phase, be well stabilised at the burner and contain high turbulent mixing to produce the short burn out time necessary in the tight confinement of a shell boiler fire tube. The only way of meeting this specification is to use a prime fuel — either gas or oil — to provide a base flame into which the PF can be combined.

Burner Design

The obvious way of producing this feature was to start off with the standard AW rotary cup dual fuel burner, using the low fire flame as the base flame. The method of introducing the coal had to be such that it in no way interfered with the normal operation of the gas or oil



burner, but at the same time introduced it into the base flame at a position which maximised the ignition rate and turbulent mixing of the two fuels to produce the required combustion conditions. Investigations showed that coal could be satisfactorily introduced through a purpose designed nozzle. Coal is distributed through a manifold situated inside the burner windcasing, fed by a single supply pipe entering through the side of the windbox. The overall burner shape and dimensions are completely unaltered by this inclusion. The only visible evidence of the coal firing feature is the feed pipe entering the windbox.

The Current Situation

Demonstrations on an operation boiler to boiler manufacturers, oil companies, CEEB, NCB and a number of key potential users have been extremely successful. Application studies and trials are continuing so that solid fuel quality limits may be established with respect to technical and commercial acceptability and to obtain detailed performance data on this range of fuels.

Pulverised Fuel Availability

The introduction of a triple fuel burner using

P.F. presupposes the availability of adequate and reliable supplies. Hamworthy are now in consultation with manufacturers who currently supply PF to foundries, with other possible suppliers including the CEEB and CDL.

Pulverised fuel storage and handling

Depending on the size of the plant, two basic alternatives are suggested:-

1. Plant using less than approximately 200 tonnes per week.

It is intended to standardise on two basic sizes of PF storage silo — 30 tonne and 50 tonne units. The bottom of the silo is fitted with vibrating grids to ease the flow of fuel into the pneumatic transporter mounted on the bottom of the silo. Also fitted to the bottom of the silo is an injector for introducing inert gas for top blanketing of the fuel. The pneumatic transporter is activated by a level demand in the boiler service hopper. A rotary metering valve at the bottom of the hopper is operated by a variable speed motor controlled by boiler demand, and the metered flow of PF is fed into the inlet eye of a carrier air fan. Ash from the boiler is removed by a conventional dust extractor.

2. Plant using more than 200 tonnes of PF week

Depending on current fuel costs, plants of this size may now have an economic justification for preparing pulverised fuel on site. The system will be similar to that described above but instead of PF being supplied by road tanker it would be supplied from the central milling plant on site which would in turn be fed from a stock yard or additional silo of washed singles/smalls on low cost fines.

Potential for triple fuel burners

Already there have been orders for the Hamworthy system both from users of existing AW burners and from potential customers for new plant who may not yet be in a position to use pulverised coal but see the sense of being equipped to take full advantage of it in the future.

Further information on PF/Oil burning from Hamworthy's Irish agents C&F Ltd.

**NEI
THOMPSON
COCHRAN**

The Thermax comes from Thompson Cochran, the market leaders in boiler

We offer you the benefit of years of experience...

...the Coalmaster III boiler with a choice of combustion systems.

For over a hundred years, Thompson Cochran have been making coal fired boilers, and the knowledge and expertise that they have gained during this time has made them one of the leading authorities on the subject. This knowledge and expertise have now been combined in the creation of the Thompson Cochran Coalmaster III, a boiler which incorporates some of the latest developments in coal firing technology.

The Coalmaster III

The Coalmaster III is a three pass boiler designed to provide a constant supply of steam or hot water. It will run on a wide range of coals. The design of the Coalmaster III permits different types of combustion appliances to be used in the standard shell, and this allows the type of firing unit that is used to be perfectly matched to the most economical coals available.

Coalmaster III with Underfeed Stoker

Although only suitable for burning 'singles' grade coal, an under-stoker offers a very wide turndown ratio, and is therefore particularly suitable for use in situations where a wide temperature range is encountered, such as greenhouse heating, and where the steam or hot water requirement is for evaporations of 2,000-7,000 lbs/hr.

Coalmaster III with Low Ram Stoker

Suitable for providing a steam output of 5,000-12,000 lbs/hr, a low ram stoker offers a maximum grate area, a shallow and evenly distributed fire bed, and a maximum ram width for any particular furnace diameter. It therefore allows a great variety of fuels to be burnt.

The choice, quite simply, is yours.

The boiler is ours.

The Thompson Cochran Coalmaster III.

Thompson Cochran. The boilerhouse of Europe.

Coalmaster III with Fixed Grate

With a fixed grate system, a packaged automatic forced draught modulating coal burner will provide a steam output of between 5,000 and 25,000 lbs/hr.

Coalmaster III with Chain Grate

A chain grate stoker will burn either a low grade fuel, or one of the clean grades of coal produced by modern coal preparation plants. When combined with an automatic ignition system, a chain grate stoker becomes as versatile as an oil or gas fired boiler. Chain grate systems will supply between 2,000 and 18,000 lbs/hr with a single furnace, or up to 35,000 lbs/hr with a twin furnace.

Coalmaster III with Fluidised Bed Combustion

Fluidised bed combustion mechanisms allow the boiler to be more compact than when using a mechanical grate, and provide higher rates of heat transfer. Bed levels can be easily controlled, as can bed temperatures, and this enables the system to operate extremely economically.

With such a variety of combustion systems, there is one to suit almost every application.

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TC185

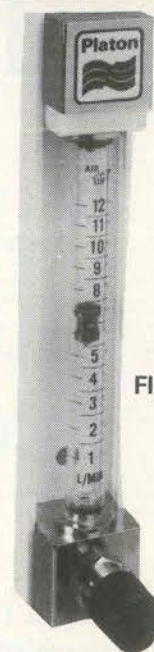
A Condensed Guide to MANOTHERM activities

THOMMEN CALIBRATOR EM



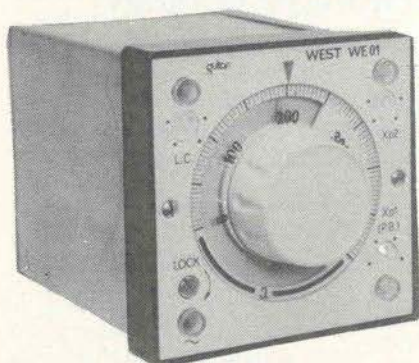
Type EM 421
410 x 260 x 230 mm
approx. 8 kg

Indep. from mains Separate power supply 24V D.C.



Platon
Flowmeter.

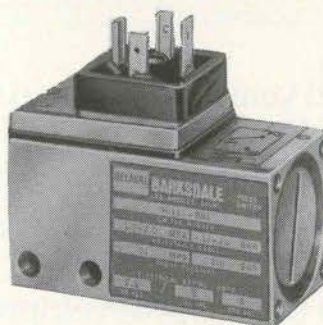
West WE 01 process controller



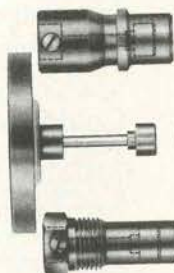
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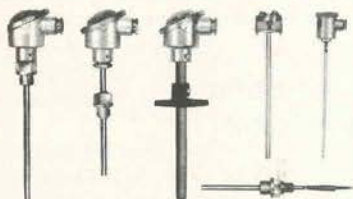
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BOILERS

manufacture. Combining the strengths and manufacturing 'know-how' of Thompson, Cochran and of Ruston, who between them have over 300 years' experience in boiler production, Thompson Cochran have produced the Thermax. Built to exacting British Standards 2790 and AOTC requirements for unattended boilers, the Thermax is a fully automatic packaged unit. Developed, tested and proven under rigorous conditions, and subject to the strict Thompson Cochran quality control procedures, the Thermax is rugged and reliable. It has been specifically designed for the production of steam. Despatched from the factory and painted and trimmed to a high quality finish, the Thermax is supplied ready for immediate installation and commissioning in dairies, power stations, distilleries, breweries, food processing plants, factories or wherever steam is required.

A range of oil, gas and dual-fuel burners is available, specifically designed for the Thermax. Thermax is fitted with a modulating rotary cup oil burner suitable for grades of fuel oil between 35 and 3500 seconds Redwood No 1 at 38°C (100°F), Natural/Town gas, or any specified alternating combination of liquid or gaseous fuels. Outputs from 6950 to 35000 lb/hr.

Further details from Concord Engineering Co Ltd, Bellevue, Islandbridge, Dublin 8, (Tel: 770650/770564).

DUFFERIN SERVICES

The necessity for operating clean and efficient boiler and steam raising plant in the present depressed economic situation, both in financial and conservation terms, is more important now than ever before.

Dufferin Industrial



● The 3500 lb/hr Thermax Three from NEI Thompson Cochran.

Services Ltd, have always recognised the need to provide a fast chemical cleaning service embracing all types of boiler plant from the large power station units to the smaller factory package boilers. They take pride in being the leaders in the cleaning field in Ireland for the past thirty years, achieved by seeking out and acquiring the latest equipment and methods enabling us to keep ahead of our competitors. This expertise has been utilised in solving the cleaning problems of many customers both North and South.

They have also been the innovators in the high pressure water jetting business, taking delivery of their first machine in 1965 and are founder members of the Association of Water Jetting Contractors. At the present time they operate a fleet of highly mobile self-contained high pressure water jetting units

capable of pressure of up to 12,000 PSI which, coupled with the technical know-how, accumulated only through long experience, principally in the cleaning of heat exchangers, boilers, condensers and ancillary equipment, including oil storage tanks in oil refineries, power stations, fertiliser plant, etc., but over the years they have cleaned buildings, cranes, bridges, ships' hulls, drains and sewers and various other items too numerous to mention.

They are now perfecting new techniques which will take the firm even more competitive and look to the future with growing confidence.

MANOTHERM LIMITED

Manotherm Limited is a leading company in the

instrumentation business in Ireland.

The Manotherm range of instruments is vast and covers in the temperature field, everything from temperature sensitive crayons which melt at a specific temperature through dial thermometers, multi-point electric thermometers, thermostats, controllers, portable digital thermometers to portable infra-red thermometers through which you merely look at the object and the temperature is displayed digitally.

In flow measurement they represent G.A. Platon famous for the Gapmeter and Flowstat — this latter a unique device which ensures a uniform flow of media regardless of pressure fluctuations upstream and downstream in the line. A big outlet for the flostat is in distinct central heating schemes — everybody gets the same heat and the fellow at the

BOILERS

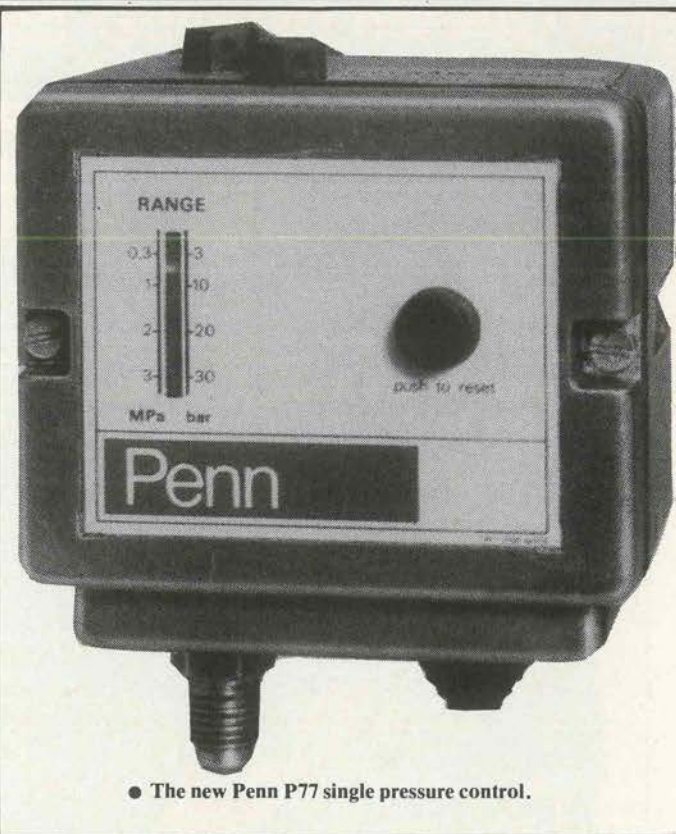
end of the line is not left to freeze.

Manotherm is also very much in the air conditioning field with the famous Velometers which is a stock item, and its younger brother the Thermo-Anemometer for very low air flows. They stock a wide range of vacuum and pressure gauges, and pressure switches sensitive enough to detect a change of 0.01" WC to others capable of operating at 20,000 psig.

Manotherm also stock flow switches for all applications from fan-control in ducts to D.P. cell types for corrosive media in large pipelines. The current energy crisis coupled with the recession is helping Manotherm to sell more. They supply the measuring instruments and controls for checking all parameters such as, ventilation and insulation flow rates, temperature and humidity in clean rooms, cold rooms, storage rooms etc. They also supply recorders to check on these parameters and to check electrical consumption. With their vast expertise they are able to advise the customer how best to achieve fine control over their particular problem areas, and this conserves costly energy.

THERMPLANT

One of the principal drawbacks of coal-firing by conventional stokers is that it limits the size to which a packaged shell-type boiler can practically be stretched.



● The new Penn P77 single pressure control.

Owing to the reduced rate of heat release from coal, the generation of steam by coal requires a significantly larger furnace area to accommodate the stokers, compared with gas or oil burner equipment. To fit such larger stokers into the fire tubes of shell boilers results in larger and larger overall drum sizes as evaporation rate increases. It is generally agreed that the upper limit at which a coal-fired shell boiler can be built economically and shipped and installed as a package corresponds to a steam evaporation rate of 20,000 lb/h to 25,000 lb/h in the normal process pressure range.

This compares unfavourably with gas and oil firing with which evaporation rates of twice

this figure can readily be achieved with a packaged unit.

The boiler operator who requires, say 35,000 lb/h of steam and is inclined to burn coal is faced with the problem of either installing two or three boiler units or indulging in the luxury of an expensive water tube boiler, which whilst having decidedly advantageous operational benefits, have traditionally been uneconomical to purchase for requirements below about 85,000 lb/h.

Middle Range Requirement

There exists, therefore, a gap between about 25,000 lb/h and 85,000 lb/h where coal-firing might be seen as unsuitable. To fulfill this clear requirement, Green's have developed a range of packaged water-tube coal-firing boilers which includes provision for both conventional and fluidised bed firing.

These boilers are designed as genuine packaged units which can be transported to site in one piece. At the same time, the principle of custom-building is adopted throughout, matching size and performance closely to

the client's precise requirements. This is, of course, one of the many advantages of water-tube design.

Danstoker

A complete range in package boilers is available for hot water and steam production, using oil, gas, coal or turf. The solid fuel boilers have been specifically designed for coal and turf firing and therefore can attain the same high combustion efficiencies which are expected from the oil and gas fired versions. The range extends up to 28,000 lbs/hr on oil and gas, 25,000 lbs/hr on coal.

The Danstoker boiler has been in wide use in Ireland for many decades in hospitals, schools, factories, nurseries etc. A feature of their use has been their versatility with regard to the type of fuel used without loss of output or efficiency combined with a very high level of reliability.

New Range

The Green's range is made up of two basic design types, both of fully natural circulation. For conventional firing, a double 'A' frame configuration is adopted. The steam drum, downcomers and box headers form a framework which contains the water-cooled furnace chamber and integral radiant and convection tube banks. Integral pendant superheaters or economisers sections can be incorporated in the package. The stoker unit is mounted between the box headers ensuring adequate water cooling.

In addition to the inherent benefits of natural circulation, the Green's coal-fired boiler range offers the advantage of compactness and minimum weight. A typical stoker fired unit, providing 30,000 lb/h of steam, would occupy a floor space no greater than 4m x 4.5m and weigh approximately 45 tonnes full. This less than half the area and weight required

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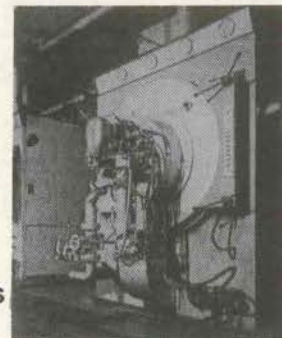
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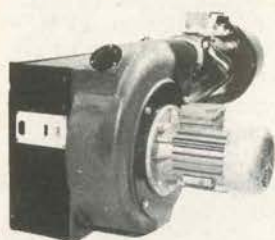
"Rio" Domestic and
Commercial oil fired
boilers 60,000 - 604,000
btu/h Rio Gas Boilers
(Atmospheric Type)
60,000 - 400,000 btu/h



Space Heaters
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million btu/h



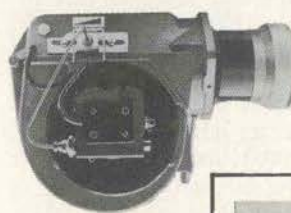
RADIANT SUPERJET



Blown Gas
Burners
60,000 -
24 million
btu/h



Oil Burners
60,000 - 24 million btu/h

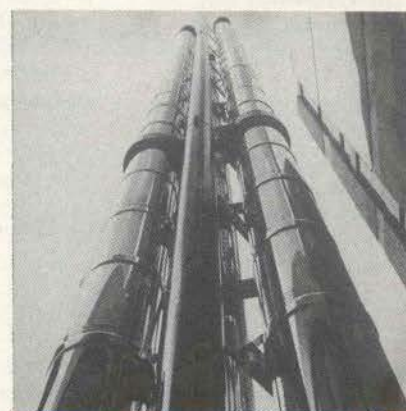


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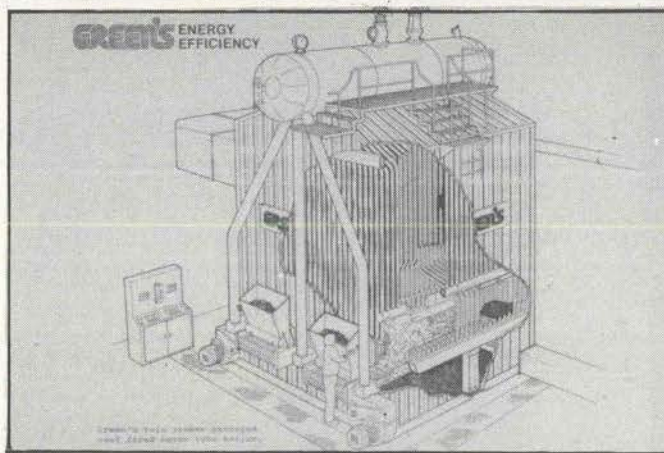


HEVAC LIMITED, LISTER COMPLEX, BALLYMOUNT ROAD, CLONDALKIN, CO. DUBLIN.
TELEPHONE: 519411.

BOILERS

for the equivalent shell boiler (although a 30,000 lb/h stoker fired shell boiler is a doubtful proposition and it is likely that two shell units would be required).

Thermplant is the exclusive agent in Ireland for Green's boilers and economisers. Thermplant Engineering Limited, 2 Deansgrange Industrial Estate, Kill Lane, Co Dublin, (Tel: 01-85022/85064 Telex: 24409).



● Green's twin stoker packaged coal fired water tube boiler.

and countless contract and servicing companies throughout.

Development is continuous ensuring that new products are introduced to meet the demands of the authorities and appliance manufacturers.

G W MONSON

G W Monson & Sons Ltd of 18 Ballyblack Road, Newtownards, Co Down, Tel: 812350 and 8 Lr Mount St, Dublin 1, Tel: 765627 are agents in Ireland for Cradley boilers which have been widely used throughout the country over the past 20 years. Of robust construction the 'Cradley' has an excellent reputation for both durability and reliability, and is available for oil, gas and solid fuel applications. Sizes range from 1,000 lb/hr to 30,000 lb/hr. Medium and high pressure hot water boilers are also available complete with their own packaged pressurisation equipment.

Complementing this range of boilers, G W Monson & Sons Ltd are the representative in Ireland of Midland Combustion Limited, whose range of oil pumping and heating units are widely used.

TEKNIGAS

Burners and controls are an important and integral part of the design of all gas burning equipment. The demanding and ever stringent technical requirements of the test houses and the need of the appliance manufacturer to become even more competitively priced, makes it increasingly essential for burners and controls to be utilized that are authoritatively accepted and well proven.

Teknigas Limited, based at East Grinstead, with over 50 years experience in these demanding fields, have the expertise to supply the requirements of the complete burner and control package, not only for the OEM but also for the service and replacement side of the industry. The very wide Tekni range of products covers the domestic, commercial and industrial fields in a diversity of industries including central heating, space heating, process plant, catering, etc.

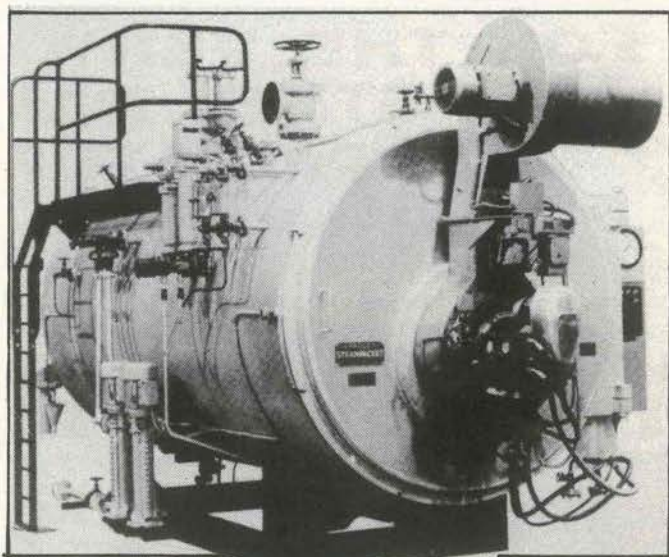
Of particular interest

to the commercial and industrial plant manufacturers will be the Tekni thermo electric and electronic flame protection sets covering fully automatic and semi-automatic operation, solenoid valves, and the wide range of natural draught burners and injectors. Included in these is the Teknipol burner range which has evolved over the past 3 years following the sole manufacturing and marketing agency agreement entered into in July 1978 between Teknigas and Industrie Polidoro of Italy, who are one of the leaders in burner design, having been established in this field for over 30 years. The long established expertise of both Teknigas and Polidoro in the development and application of burners for a variety of appliances has combined to give manufacturers the maximum benefit.

For the service side of the industry Teknigas have a network or carefully

selected distributors, affording off the shelf deliveries of the complete range of Tekni controls and ancillaries, adequately serving the heating trade throughout the UK allowing the service engineer to effect his maintenance with the least possible delay.

With this mind the Tekni Universal thermocouple type 7000 was specifically designed to minimize both time and cost for the service company which ultimately benefits the end user. Teknigas, who already manufactured a wide range of thermocouples, successfully introduced this thermocouple and related adaptor kits to the industry some 3 years ago since when it has been successfully used in ever increasing quantities by the British Gas Corporation



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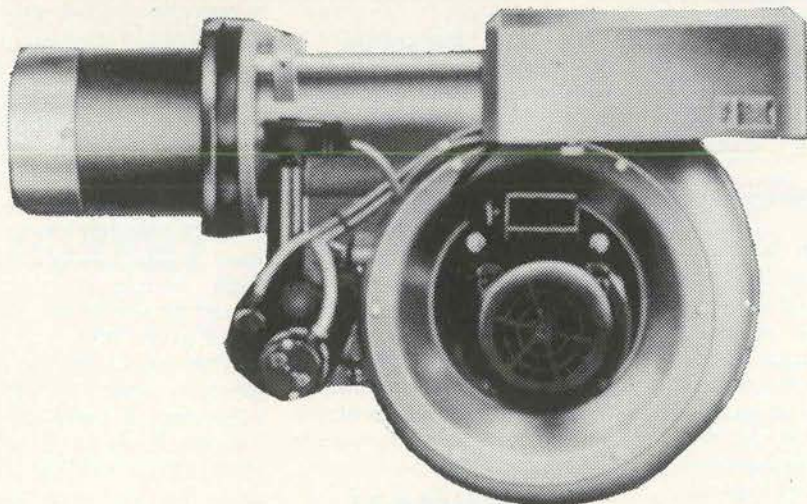
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BOILERS

B&E BOILERS

B&E European Fully Automatic Treble Pass Wet Back Steam Boiler

The European steam boiler is offered in 15 shell sizes ranging from 2250 Kg (5,000 lbf/hr) to 16300 Kg (36,000 lb/hr) F & A 100°C and for standard pressures up to 1.722 N/mm² (250 p.s.i.g.). Higher pressures are available on request.

The boiler is of treble pass design and has a low set furnace with the final passes formed by two banks of straight horizontal smoke tubes expanded into three tube plates.

The boiler range is constructed to the latest British Standard Codes 2790 and will comply fully with proposed amendments.

The European boiler is designed with a

conservative over-all heat transfer and adequate safety margins on gas exit temperatures. This ensures high efficiency and long life. Efficiencies, dependent on fuel used, vary from 82% - 84%

The Burgess Metro-Flex Isolator

Consider what happens to the heat in your boiler when you go home at night or for the weekend. That temperature/pressure which cost so much fuel and electricity to establish just goes up the chimney. The same thing happens when a boiler is kept at pressure for standby, or when the burner goes out on a 'duty' boiler.

With the patented Burgess Metro-Flex isolator, the "door is shut" and the boiler will retain its temperature/pressure for much longer periods resulting in fewer surge demands on burner starts, lower fuel consumption, lower electrical

consumption and minimised smutting potential.

Site tests have shown that fuel savings of up to 15% are possible, and pay back periods of under one year on the low capital cost are common.

The type of plant installed, fuel used and chimney arrangement will vary and specific expert advice is recommended.

For details on B&E in Dublin contact: Hugh Siddall and Pierce Tiernan. Belfast: Henry R Ayton.

units covering outputs from 190 to 644 Kw (650,000 to 2,200,000 Btu/h). The units are designed for pressure jet oil-firing, blown gas firing or dual fuel applications for central heating and indirect hot water and incorporate Dunphy burners. The series features a new concept in section design providing easy maintenance and a high efficiency of 80% based on the gross calorific value of the fuel.

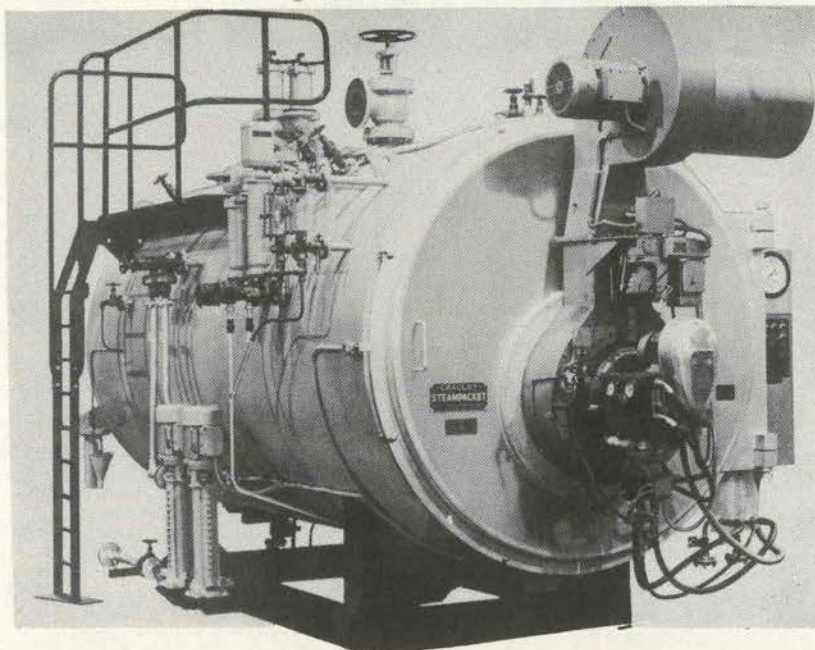
The other addition to the Beeston range, the Bewley, comprises 8 units covering outputs from 44 to 147 Kw (150,000 to 500,000 Btu/h) and features new section design, pushed nipple assembly, atmospheric gas burners, improved insulation and jacket design contributing to an operating efficiency of 78% based on the gross calorific value of the fuel.

The ever-popular Robin Hood range has positively thrived due to its reputation for reliability and flexibility, and continues to maintain a prominent posi-

BEESTON

The Beeston Boiler Co. (Successors) Ltd. has launched 2 new boilers of cast-iron sectional sectional design recently. The two new boiler ranges are the Broxley (dual oil/gas) and the Bewley (atmospheric gas), both offering new standards of efficiency and ease of maintenance. The Broxley series comprises 11

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● CRADLEY STEAMPACKET
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Cradley Boiler Company Limited

Cradley Heath
Warley, West Midlands B64 7AN

Telephone: Cradley Heath 66003
Telegrams: Cradboiler Warley Telex 337024

Irish Agent: G. W. MONSON & SON LTD.

18 Ballyblack Road, Newtownards, Co. Down. Phone: 812350.

8 Lower Mount Street, Dublin 2. Phone: 765627.

BOILERS

tion in Beeston's production schedules. The range can be supplied suitable for gas, oil or solid fuel firing and covers outputs from 66 to 682 Kw (224,000 to 2,326,000 Btu/h).

For further information contact Ummack Ltd.

DUNPHY

Innovation has been the keynote at Dunphy Oil and Gas Burners Limited, Rochdale, Lancs., for the last two years during which period a completely new burner range has been developed. This is the "T" Series (the letter "T" representing the Company's patented Turbine design). The range covers ratings from 200,000 Btu/H (60 Kw.) to 30 million Btu/H (8,800 Kw.). Despite this wide range the Company has been able to condense the designs into only 5 basic frame sizes. In three years the company has completely re-structured its production line to exploit the

proven advantages of its unique, patented Turbine design. (Patent No. 1553767, 1979).

Fuels covered are:

- light distillate oils up to 50 secs Redwood No. 1 at 100°F.
- heavy oils up to 4,000 secs Redwood No. 1 at 100°F.
- natural gas
- dual fuel mode (natural gas/light oil)
- L.P.G.
- sludge gas

Dunphys fans are purpose-made to their own parameters; the vital task of balancing is not left to outsiders. Each fan is individually balanced, using sophisticated new plant, to a figure equal to, or better than, the smallest achievable residual unbalance permitted by I.S.O. 1940-1973 (E). The result - a marked reduction in sound levels and a machine that is vibration-free.

The company has recently introduced System 2000 - a new concept in the provision of an A.O.T.C. steam boiler control panel.

Produced by Dunphy engineers as a design aid for Package Steam Boiler manufacturers or for steam boiler conversions, it is available in 4 options all based on the same module

- suspended from the boiler top on a universally mounted tubular wiring conduit
- attached to the boiler casing
- attached to the boiler-house wall or built in to a main panel
- console mounted at floor level with lockable isolating cabinet (see photograph).

All options of System 2000 incorporate the standard 'pod'. This has a fascia setting out all the necessary functions to comply with A.O.T.C. requirements in 'mimic' form in colour. All control signals lights are in appropriate colours.

ROBEY

The new range of Incendo boilers is an addition to the existing comprehensive range of Lincoln boilers al-

ready marketed by Robey of Lincoln which are suitable for firing by the various types of fuel available. The Incendo boiler has been introduced into the Robey range in order to cater for an increasing market requirement for solid fuel fired boilers and by its introduction now enables Robey to offer its customers a wide choice of combustion equipment for solid fuel.

The Robey Incendo has been developed in conjunction with Greenforge Limited, and in the majority of cases, the boilers will be available as packaged units although some items of equipment may require re-fitting at site. These boilers are of the three pass wet back design and will be available for outputs from 5000 to 25,000 lbs. of steam/hour, from and at 100 degs. C.

Robey boilers are available from S L Combustions Ltd.

CONCORD ENGINEERING CO. LTD.

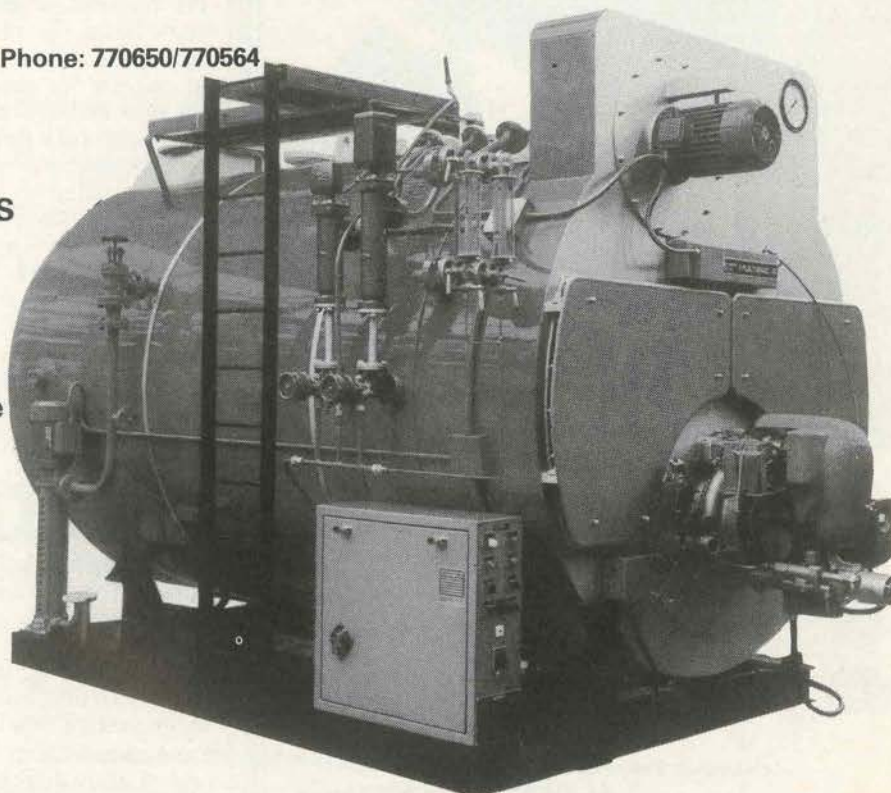
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Agents for **NEI Thompson Cochran Ltd**

BOILERS**POWRMATIC**

As a leader for some time in the industrial warm air heating business Powrmatic are set to take the plunge. The reason? The new Powrmatic Boiler. A range of 37 models designed for commercial and industrial applications with heat outputs from 60,000 to 700,000 Btu's. They'll supply them oil or gas fired with a burner that has been carefully selected to give optimum combustion efficiency. It probably won't come as any surprise to learn that these new boilers will be as well designed and constructed as everything else that comes from Powrmatic. Take the case for example. Two-colour self-interlocking stove enamelled steel panels that are made to take the knocks. Inside, the boiler is constructed of highly corrosion-resistant cast iron sections to ensure a long and efficient life. And to make sure you lose no more precious heat than is necessary the

unit is well insulated with mineral wool. Maximum advantage is taken of radiation from the combustion chamber too. The boiler is designed to give the maximum heat exchange.

Further information from Powrmatic or Heating Controls & Devices Ltd.

**MAXLECON
WESTGARTH**

The Westgarth range offers reliable performance at low first cost. It ensures good overall efficiency at a standard pressure of 150 P.S.I.G. Designed as a three pass fully wet back single furnace boiler for use with oil and gaseous fuels. Its design criteria have been proved and optimised by fully instrumented tests using light and heavy oils together with natural gas. Combined gas/oil burners can be supplied as required.

The extended 'Maxecon' boiler range offers a wide choice of outputs at



● One of Potterton's newest products, the CCM, "micro" boiler, with outputs from 277,000 Btu/h up to 2.8mill/Btu.

pressures up to 250 p.s.i.g., in addition, 'specials' for higher pressures are also available. Designed as a three pass fully wet back boiler for use with oil and gaseous fuels, its design criteria have proved in service over many years that it is one of the most efficient, reliable and accessible boilers produced. One of the features of the 'Maxecon' boiler is the ability, with twin furnace models, to operate for long periods on one furnace only. This gives high turn down ratios. If desired, an additional small panel gives the added facility of being carry out maintenance work on mechanical and electrical components of either burner and panel while the other is in operation.

Further information from IES Industrial (Ireland) Ltd. in Northern and Southern Ireland.

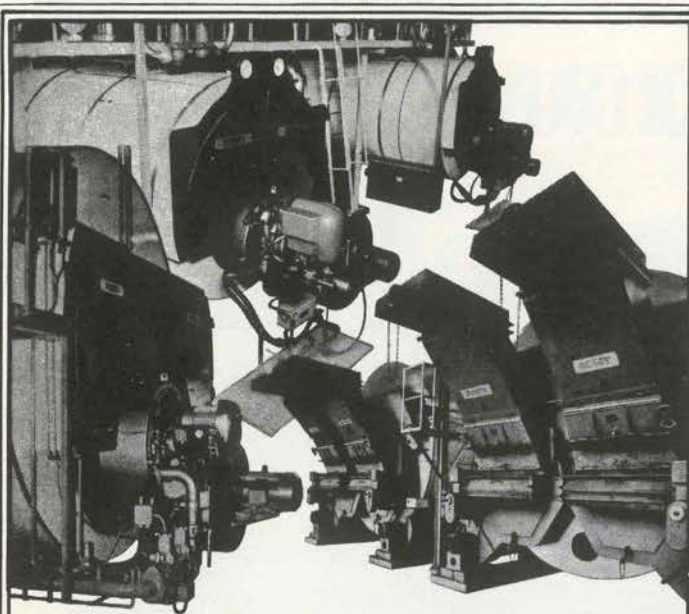
BRADLEE

The Bradlee boiler is a compact and efficient three-pass, return-flame, wet-back boiler. It is robustly built to BS 2790 in thirteen sizes, with outputs from 240 lb/hr up to 3,500 lb/hr and extra man-hole at 5 o'clock and slightly higher feet — so that the shell can be cleaned out from the side as

well as through the usual man-hole at the back of the shell. As Bradlee boilers can be built with fittings and openings on either the right-hand side or the left-hand side, this additional feature enables the boiler's very compact design to make the best use of valuable space on customers' premises. The Deluxe model also has greater access to the furnace — for inspection or cleaning — since all the inlet and outlet pipes are attached to removeable pads (of 4" square) which are themselves bolted to the shell of the boiler. The finish and durability of the Deluxe model has been enhanced by the fitting of a stainless cover to the cladding (which is resistant to corrosion by steam) and by using black heat-resistant paint for the remaining parts, other than those which comply in their colour coding with BS 1710. Other additions have been made to the trim of the boiler.

Improvements have been made to the Probe Chamber, using new ceramic probes, and adding a new anti-surge fitting to the base of the chamber.

For further information contact Heating Controls & Devices Ltd., Hendrons Bros. Ltd.

**Robey Reliability**

When reliability and quality are required Robey are chosen again and again.

"In most instances your early delivery requirements for packaged boilers can be met from our extensive stock programme."

ND**ROBEY**

A Newell Duntford Company

S.L. Combustion Services Ltd.,

Laherdane, Ballyvolane, Cork. Tel: Cork 501411.

S.L. Combustion Services Ltd.,

158 Castlereagh Rd., Belfast BT5 5FT. Tel: Belfast 59282.

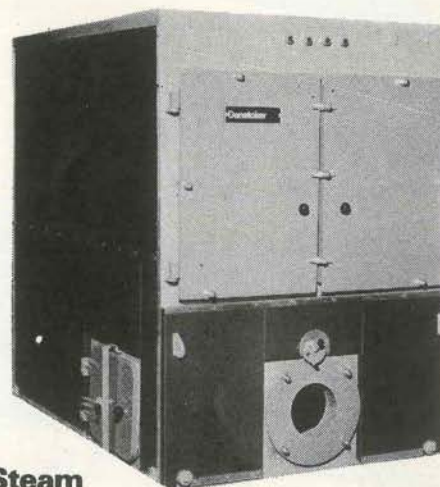
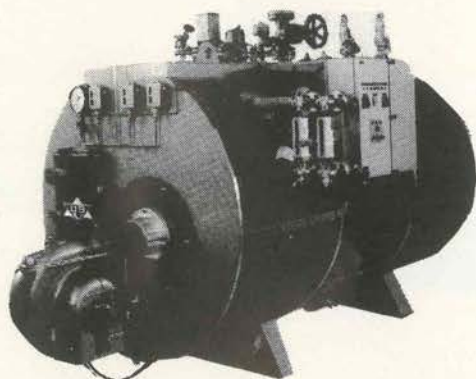


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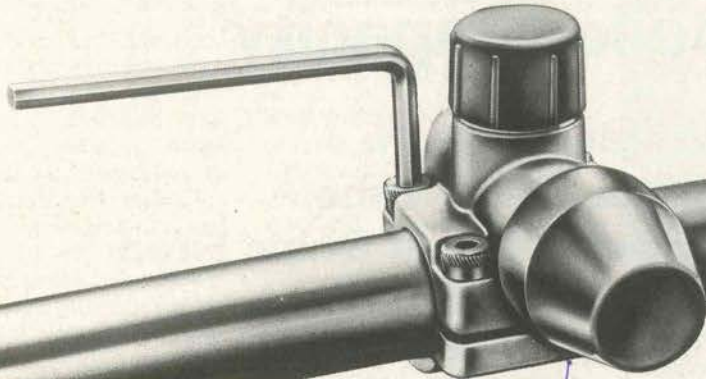


Thermplant Engineering Ltd.

2 Deansgrange Industrial Estate, Kill Avenue, Co. Dublin.

Tel: (01) 850222/850641 Telex: 24409

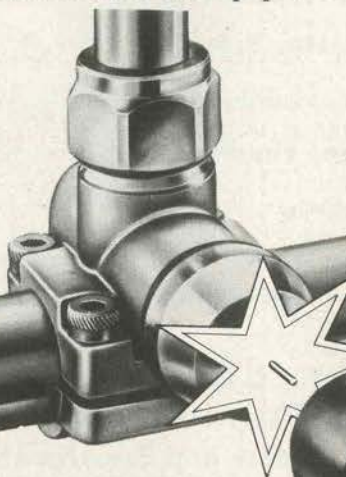
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